

# NATIONAL MARINE EXPOSITION

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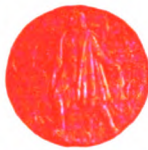
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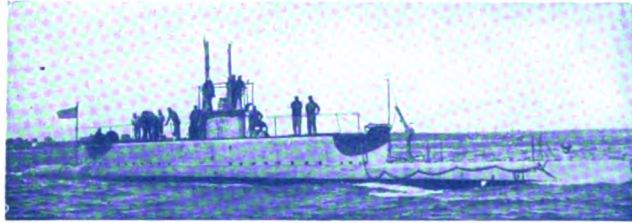
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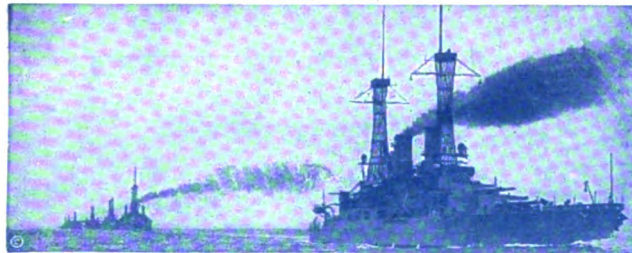
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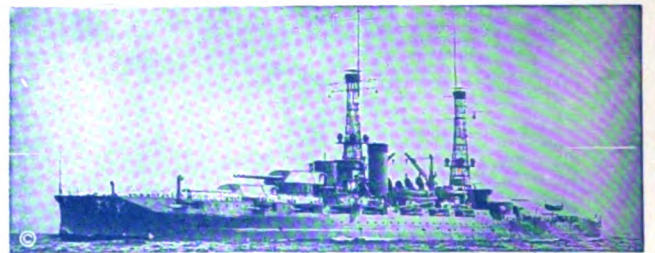
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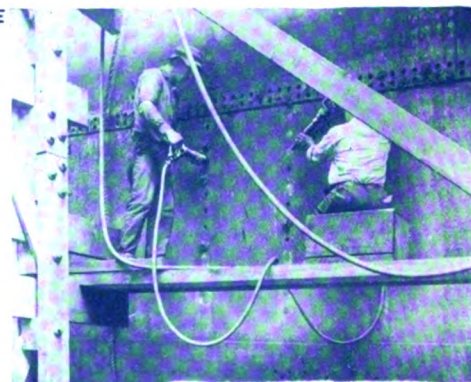
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VOL. 50

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# Simple Answers to a Big Puzzle

**Solution of Merchant Marine Problems is Found — Previous Attempts to Arrive at the Q. E. D. Were Built on Falsework**

**W**HY hold further consultations over America's merchant marine? A practical sailor, builder, manager and owner who has the added advantage of British birth which automatically guarantees his thorough grasp of things maritime, has spent 20 years in the United States and has found the answer. All this talk of prewar days to prove why the dying merchant marine would continue to waste away; all this talk of postwar days which proves why the very lively corpse really isn't lively but would soon act like a corpse should act; all discussions of restrictive laws, congressional indifference, subsidies, drawbacks, and naval reserve crews, are fleeting bits of nonsense.

## *National Unscrupulousness to Blame*

The answer to the past, present and future of an American merchant marine has no relation to any of these. Two small points cause all the trouble and knowing them, your brainstorm of years' standing clears up in a flash. Americans have not been a success on the sea because they are too unscrupulous. They will never be able to compete on the seas as long as they continue to be a congress-electing people.

In brief, then, the trouble is the unscrupulousness of a free nation with universal suffrage. This analysis is not made by a professional humorist but by a Britisher claiming the qualifications given, who took the time to put his arguments into writing and *The Syren and Shipping*, London, went to the expense of putting the letter in print as a leading article.

Probably a charge that 110,000,000 people are unscrupulous might lead in Europe to an increase in military strength—to Americans it is tinged with humor, is a reflection on the mental stability of its author. Any student of national traits claiming the practical experience of this analyst should have hesitated before basing conclusions on loose rumors, a dangerous source for generalizations.

For instance, lake built ships, he reports, must make everything 100 per cent stronger and then double that if they intend to build for ocean service. No man with any claim to marine knowledge would betray his ignorance of lake conditions, of the skill with which lake shipbuilders have developed a type of ship found no where else in the world and which has proved so efficient that transportation costs on lake bulk freighters are lower than on any other freight carrying vehicle. The hundreds of ships built on the lakes for ocean service during the war, were naturally built differently to meet ocean conditions.

## *What Lake Builders Have Done*

These war-hurried ships have established a record which British yards can only equal—no lake built oceangoing vessel has shown any sign of faulty design or shoddy construction and has experienced only the mishaps which all ships, British built or not, encounter in service. Improvement in shipyard practice which lake builders have introduced and which have been copied abroad as well as at home, make a sweeping criticism of their ability smack either of ignorance or malice.

Some American shipbuilders are honest, even this correspondent admits, but not enough. He finds the inspection system is permeated with graft; timbers so honeycombed by ants that nails would not hold the planks are covered with tallow and paint; obstinate inspectors accused of insulting somebody's wife and recalled to Washington while a deputy hurriedly O.K.'s a rotten job and the ship delivered.

Such drivel is worth attention only as emphasizing the character of reports with which foreign shipowners inclined to place orders in the United States are confronted; of efforts made to cripple the American shipbuilders' standing abroad; of the attempts to shove down the American ship operator and to injure the reputation of the entire nation. Unfair weapons are more likely to injure rather than aid the man who uses them.



# World Charter Market Reviewed by

## FIRM POLICY

**New Head of Shipping Board Plans  
Aggressive Campaign—Westbound  
Atlantic Freight Movement Grows**

**R**APID and important developments in Washington last month have had and are still having an important effect upon the business of ocean navigation under the American flag. Under Admiral Benson, the new chairman of the shipping board, the government has set out to establish a more workmanship agreement with private operators by which the government and the operators will share in the profits derived from the public fleet. Army piers will be utilized for this new merchant marine and foreign agents aided with co-operation from American consular officers and commercial attaches will be established. The small and the new American ship operator will be given an opportunity to get into the business. In accordance with the new ship operating agreement, the shipping board will no longer promulgate schedules of freight rates but will leave such rates to be determined by the local managers of the government's fleet. The practical result of this will be that ocean rates will be determined by conference agreements, much after the fashion they were fixed prior to the war.

### **Plan to Use German Lines**

A proposition, reputed to have been made by the Kerr interests, to have the government take over the 60 routes occupied by the German lines prior to the war has been brought forward and the shipping board is inclined to act upon it. The German shipping interests have no ships, but do have terminals and agencies. America has the ships but as yet lacks organization. The British are now attempting to occupy some of the German runs and for the United States to enter into such an arrangement as proposed is held out as a means of competing with the British marine plans. Chairman Benson stated that, in his opinion, Germany will have no ships available for at least five or six years, and that under the terms of the peace treaty it will be as much as 20 years before she can furnish any real competition for Americans. He believes that if American companies cannot obtain the trade by that time, the outlook is hopeless, for American shipping. He has made it plain that he intends to go ahead and develop these lines, despite the protest of the American Steamship Owners' association, but he does not propose to give a monopoly to any one American company.

Despite any opposition that might arise to the shipping policies of the present administration, Chairman Benson is determined to follow his plans for making the operation of the new American fleet a success. It will be no easy matter to shift him in that determination and already he has won the confidence and support of congress. The stage has been cleared for

a red-hot fight with British shipping for supremacy in merchant shipping. Uncertainty has previously delayed the inauguration of an aggressive shipping campaign, even the repair of American vessels being delayed. But orders have gone out from Washington and the reconditioning is now being hurried. The *CALLAO*, the second passenger vessel for the New York-South American run, has sailed. The other former transports will be ready for commercial service as rapidly as the repair yards can turn them out. This work will no longer be delayed in the hope that a sale to private interests can be effected.

Inasmuch as such strong government support seems assured a changed attitude in marine circles has been noticed. It is proposed to exempt marine insurance companies from the antitrust laws so that American insurance can be supplied to the American merchant marine. At the same time the British insurance companies have agreed to sell dollar contracts in the United States, thus making their policies more attractive to American shippers. The success of the new shipping board's aggressive policy depends in considerable measure upon the behavior of labor. With labor working steadily, vessels can be operated with a minimum stay in port. On the other hand, if shipping is repeatedly tied up due to strikes overhead charges increase enormously.

### **Charter Market Irregular**

Longshoremen on the Atlantic struck last month, resulting in a daily loss of about \$35,650 to the coastwise lines. Private marine companies fear a dwindling of their profits during 1920, although the reports so far made public show that their earnings were larger in 1919 than in 1918 and that to date their earnings have been about as good as last year. The Harriman interests are now offering a new issue of stock in the American-Hawaiian line, which it is expected will yield a dividend of about 10 per cent. Uncertainty has existed in regard to the probable future earnings of American ships. Freight brokers have been prophesying a decline in freight charges, but with the promulgation of the new policies from Washington a decided stiffening in the rates is apparent. London has advised of a further increase of 13 1/3 per cent in westbound passenger rates. This makes the rate increase, promulgated by the North Atlantic steamship companies, 33 1/3

### **Want Dockyards Used**

**T**HE committee recently appointed to investigate the possibility of using British royal dockyards for private shipbuilding has just reported that the admiralty should use its surplus facilities for building merchant tonnage. Concentration on merchant vessels by the building yards, it is declared, would release sufficient repair and reconditioning work to keep other dockyards busy. This, however, is recommended as a temporary expedient. Objection is raised to any plan of leasing portions of admiralty dockyards to private builders as this would not be a commercial success owing to the dual control. Emphasis is placed on the temporary character of this expedient.



# Experts in This Country and Abroad

per cent since July last, necessitated by the difference in exchange.

The charter market has shown a fluctuation during the past 30 days but a stability toward the end of the month. Coal charters from Virginia cities to Antwerp have brought \$20.50, to Rio \$14.50, to Rotterdam \$20, to French Atlantic \$20.50 and to Hamburg \$21. Coal charters from Virginia cities to River Plate have fluctuated from \$13 to \$14, while to West Italy they have fluctuated between \$22 and \$24. Charters for lumber from Gulfport to River Plate have brought \$35; phosphate from Tampa to Bilbao, \$27; linseed from Buenos Aires to New York, \$24; and phosphate rock from Port Tampa to Savannah has brought \$4.75 and to Hatteras \$5.75.

Time charters during the month have shown an even more marked fluctuation. Early in March two Norwegian steamers were taken for one round trip each at \$7 and \$7.50 respectively. An English charter was signed at 40s for 12 months and 30s for six months. After the middle of the month, a steamer charter was signed at \$9.75, and another for six months in the gulf trade went for \$9. Immediately afterward a schooner was chartered for \$7 and a Norwegian steamer was taken for one round trip at \$7.

## Predicts Stiffer Rates

Releasing control over national tonnage by the British government has at last given the British steamers opportunity to dispose of their space to better advantage. As a consequence, the ocean freight rates increased to from 45 to 75 cents a hundred pounds on foodstuffs from the United States to England. A stiffening of freight rates has been confidently predicted by steamship people. So long as bunker coal at London and Liverpool costs 155s a ton, a decline in rates cannot be expected. English coal has advanced 40s a ton during the past year. American vessels are paying

from \$7 to \$8 per ton on this side. North Atlantic ports have continued to rule steady for heavy grain at 8s 6d per quarter, with option of flour at 50s per ton to the United Kingdom. Cargoes to France and Italy have been accepted at proportionate increases. While West Indies sugar has stood at 50s, rates of 140s to 145s have been obtainable to the continent. The unusual amount

## Bid on Leviathan

**B**IDS for reconditioning the **LEVIATHAN** will be opened May 1, according to the present position of the shipping board. Refitting plans provide for making this vessel one of the finest passenger liners afloat. Cost of this work is set at approximately \$6,000,000. From 10 to 12 months will be required. The shipping board is seeking a lump sum offer for the work and has definitely decided against a cost plus form of contract. Five concerns are expected to bid on the job and the navy will probably figure in the bidding. Owing to her great draft, the ship will likely be repaired in New York. The **LEVIATHAN** registers 54,282 gross tons and was built in 1914 at Hamburg.

## MARKET STRONG

**Situation on Pacific Is Firm—Some Japanese Lines Reduce Rates — Passenger Space Is in Demand**

of tonnage thrown into the South American trade has caused a drop of \$2 per ton for steel and machinery from north Atlantic ports to Buenos Aires and Montevideo. General cargoes have been paying from \$15 to \$17 per ton to the east coast, but steel exports have been going on the basis of \$10 per ton. This, however, does not indicate that there will be further decline in rates in this trade, but the over supply of boats offered for the steel movement has had a tendency to pound rates from \$12 down to \$10, and the volume of business is reported to have been offered plentifully.

Rates on heavy grain from the River Plate to the continent have advanced from 190s to 210s. Apparently the 20 per cent free space in boats directed to load at the River Plate for the United Kingdom, which was selling for 135s to 140s, was not sufficient to bring down the continental rates by releasing free vessels from that trade. The large amount of grain offering has more than offset the increased tonnage seeking employment. The supply of unrestricted bottoms has been recently further shortened by the attractive freights offered in other markets. Nitrates have been slow on the basis of 190s to the United Kingdom.

## Many Accidents Reported

Comment has been aroused by the unusual accidents which occurred last month to some noted extranports. The South American liner, **MOCASIN**, unexpectedly sank at her pier and the reconditioned **St. PAUL** on her first trip to England was compelled to put in at Halifax owing to boiler trouble. The **IMPERATOR**, the ex-enemy vessel assigned to the British, is reputed to be in bad condition and must undergo further repair before she can again make a transatlantic voyage. While no deliberate foul play has been discovered, it is feared by the operators that certain vessels are subjected to unusual rough handling calculated to incapacitate them. Such reports are to be expected when shipping lines begin to display signs of aggressive competition for world trade.

The Pacific Mail Steamship Co. proposes to establish services around the world with the use of government vessels. As auxiliaries, the company is establishing a chain of agencies in the Orient and Mediterranean, and also is expanding the feeder lines of small vessels to bring cargoes to the main ships. The shipping board is apparently greatly interested in such plans, as in this way it is hoped to meet foreign competition on the seas. A new service with government vessels from Pacific ports via New York to Europe is now being inaugurated. A service out of Philadelphia to the Orient is proposed. The



Green Star line will have a monthly service from Baltimore and Norfolk to Yokohama, Kobe, Shanghai and Hongkong. A new company, the Atlantic-Gulf & Pacific Steamship Co., has been formed to connect Baltimore transatlantic and transpacific. The Gdansk-Baltimore Steamship Corp. has also been organized to operate to Danzig and European ports. The New England Maritime Corp., Boston, will operate out of Galveston to the Orient.

### **Boston's Shipping Falls Off**

Continued difficulties in movement of freight on the New England railroads have caused the development of spring shipping out of Boston to lag behind the schedules formed earlier in the season. Two new vessels, the LAKE BUCKEYE, 3525 tons, and the LAKE PEARL, 3364 tons, have been assigned by the shipping board to the Coastwise Transportation Co. under the new agreement which permits their use in any trade routes desired. This new policy of the shipping board has in some cases worked to the temporary disadvantage of the Boston port, although in the long run it is expected to develop better shipping conditions. Several lines, formerly operated under the direction of the shipping board between Boston and European ports have now been discontinued in favor of other more profitable routes. One of these is the Rogers & Webb line from Portland, Me., to Antwerp, the steamers having been transferred to the coal trade from Norfolk to South American points.

### **Low Exchange Affects Exports**

Export trade for England and France has continued to drop off gradually during the month. The low exchange rate has caused a falling off in the demand for United States commodities in these two countries and this has caused such a low rate that owners and managing companies are reluctant to continue this service. On the other hand, space for Black sea and Scandinavian ports has been easily and quickly filled and freight offerings for South America have increased during the last few weeks. The coastwise trade along the New England shore has also increased. The LAKE CHARLOTTE and the LAKE GREENWOOD in the coal trade between Norfolk, Va., and Boston, have added to their regular line the carrying of lumber from Searsport, Me., to Phila-

delphia. This cargo works in particularly well with the coal trade because the vessels might otherwise return in ballast. The demand for machinery in Holland continued strong throughout March, and recent sailings have carried machine tools, mining and electrical machinery and agricultural implements, in addition to the large tonnage of general merchandise to that country.

### **Pacific Market Is Strong**

Withdrawal of shipping board tariffs has been one of several interesting features of the north Pacific charter situation during the month. This unexpected action did not undermine freights on that coast as the situation is generally strong. Operators of transpacific tonnage immediately adopted a schedule of rates which have been approved by shipping board officials. The tonnage market is so firm that these rates can now be accepted as the minimum as in some instances higher freights are being made. Shipping board officials state that while competition is restored to a certain extent, all rates adopted by operators of government vessels are subject to approval as manipulation of rates as between shipping board carriers will not be permitted. Consequently transpacific freights are still about on the same basis as the shipping board tariffs had established but with a tendency to advance. Foreign carriers are operating on the American rate levels.

### **Passenger Space Is Scarce**

Advices from Japan presage a drop in freights but this opinion is not generally shared on the west coast. Fifty-seven Japanese tramps, it is reported, will be free from present time charters during the next two months and this influx of tonnage is expected to bear freights. Anticipating this, some Japanese lines have reduced their rates by from 10 to 30 per cent. While more Japanese freighters are now coming to north Pacific ports than in a year, the westbound situation is so firm that freights are tending upward. As an instance of the demand for space, British Columbia shippers of salt herring are already making bookings for next winter in order to make sure of filling their contracts. The demand for passenger accommodations to and from the Orient is unprecedented. The regular lines are practically booked full for the next six months.

## **Quiet Strength Still Rules Market**

(FROM OUR EUROPEAN STAFF CORRESPONDENT)

LONDON, April 5.—(By cable)—Restricted activity marks the charter market, tonnage demands being relatively light. Freights show an easier tendency. Interest is being shown only in South American maize. River Plate to the United Kingdom is bringing 125s per ton, a drop of 25s in the past few days. Some demand has developed for steamers to load coal for Port Natal and Calcutta. Liner companies are beginning to feel the pinch resulting from easier conditions at the same time that costs are higher due to advanced bunkering costs and wages. Flour from the United States to Dantzic or Trieste is bringing 115s. Conditions are easier in the ore trade from the Mediterranean to the United Kingdom, but

Bilbao to Middlesborough is still bringing 39s.

Export coal is scarce. Sugar tonnage from the West Indies to the United Kingdom is in demand at schedule rates, with 140s to 142s 6d to French Atlantic ports. The eastern section is dull. Bombay to the United Kingdom would bring 130s on deadweight. Wheat continues at 150s from Australia.

Shipping congestion in British ports has begun to clear. Exports from Great Britain are growing. Dock workers at London have been granted a minimum daily wage of 16s and a 44-hour week, probably averting the threatened strike. Idle ships in South Wales ports are reported at 700, on the Tyne 400, on the Wear 120, and at Blyth 100.



# Marine Exposition Is Success

First Comprehensive Display of Wide Variety of Products  
Used in Maritime Industry—National Interest Is Aroused

**S**ELDOM has an exhibition appealed to such diversified interests as the National Marine exposition being held in New York during the week of April 12. Industrial, engineering, commercial, travel, art, and literature, all possible phases of life as it relates to things of the sea, will exercise their appeal with a little of the military thrown in for good measure. And now that the federal government is so deeply involved in shipping, the political phase will be by no means overlooked. The stage has been set, the first marine show in the United States in 20 years, the first important marine show ever held in America, has opened its portals to the public and backed by the National Marine league, the battle has begun to arouse and retain the intelligent public interest needed to insure a merchant marine in keeping with the power and the dignity of the country.

"In shipping," said Thomas Jefferson, "all industries meet," and at this exposition will be found a visualization of the great president's apothegm. The slogan is: "American cargoes, mails and passengers carried in ships built, owned, operated and manned by Americans; ships classified and insured by American companies; ships equipped and repaired by American industry." For the first time in the history of the United States, shipping, alone excluded from the sun of exhibition, is to have a place enjoyed by every other large American industry. Even in the days of America's peerless glory on the sea, no one individual nor organization brought together in one place a comprehensive representation of merchant ships and all the allied industries of the sea. And in the 50 years of maritime inaction which have just gone by, such an affair could have had little reason for existence unless it were merely as a matter of historical reminiscence or,

perhaps, to reawaken modern interest through an appeal to a powerful past.

But no such thing has occurred. America, content in the early days with her position as leader on the ocean, made no attempt to display in concrete form her genius for the sea and her maritime accomplishments. Destroyed by dissension at home, her proud fleet gradually dwindled away and a thick pall of indifference finally separated the people from the sea.

Now, with the first return to ocean power, no time is being lost to gather under one roof, exhibits of every phase of marine enterprise, and so enable the public individually to visualize the vast reaches, activities and accomplishments of American shipping. This elaborate showing, from the latest thing in cargo carriers to the recently started industry of making leather from shark and porpoise skins, cannot fail to impress on the national consciousness a vivid and co-ordinated picture of the great possibilities of American maritime life. It will establish a definite place for the Ameri-

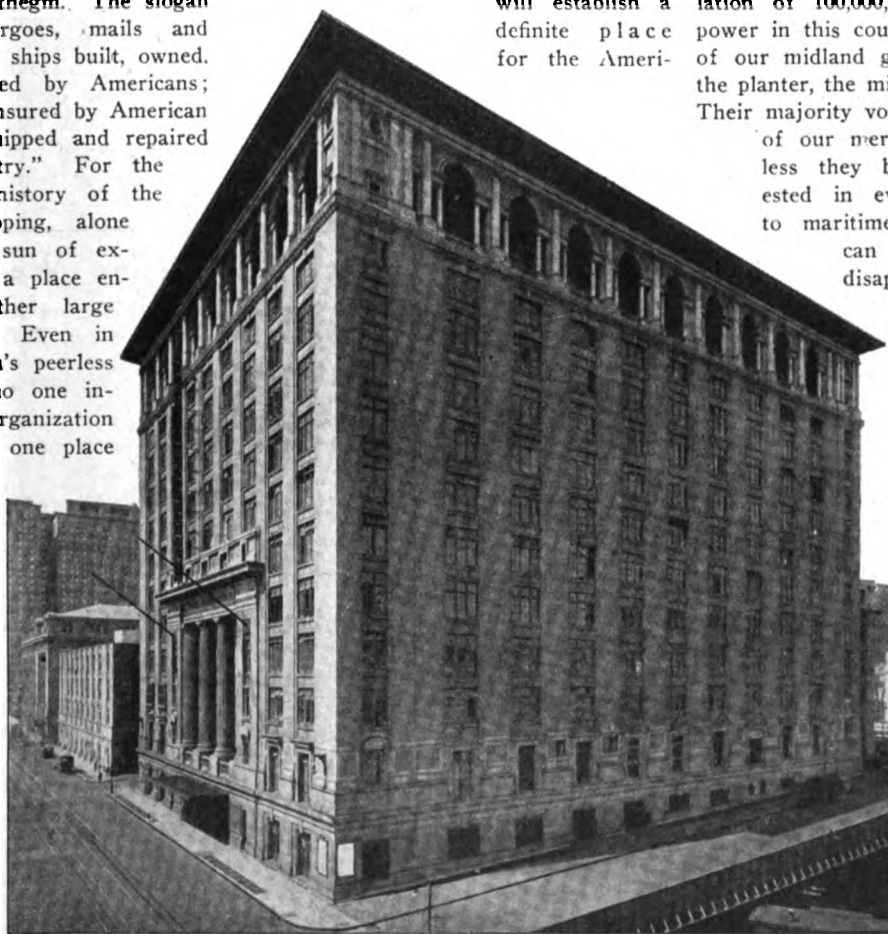
can merchant marine in the American mind.

A world-wide tendency exists at the present time to demonstrate through trade shows the value of this or that industry. Perhaps it is for this reason that the merchant marine has at last come in for its proper share of attention. A wave of popularity for this particular medium of acquaintanceship is sweeping over this country as well as elsewhere. And after decades of omission, an American merchant marine at last rides on its crest.

"It is no longer an academic question of whether or not an American merchant marine is desirable," says E. N. Hurley, former chairman of the shipping board. "Our choice now lies between an American merchant marine and bleak, stark ruin."

"The time has gone by when American shipping concerned American seaports solely. A thin line of people along a thin edge of seacoast cannot alone maintain a merchant marine for a population of 100,000,000. The balance of power in this country lies on the knees of our midland gods—the cattle raiser, the planter, the mill hand and the miner. Their majority vote controls the destiny of our merchant marine and unless they become actively interested in every problem relating to maritime affairs, the American flag will once more disappear from the high-

ways for foreign trade. "But this seems impossible. In the last few years every class of American producer has come to realize the vital importance of American ships. The farmer has come to know what it is to lack ocean tonnage for selling his fruit and obtaining fertilizer. Now he will find that refrigerator ships, built during the war, can be put to good use in handling fruits



GRAND CENTRAL PALACE, NEW YORK CITY





D. E. SKINNER

and dairy products, etc. The American stockman, who wants quick delivery service in selling his valuable breeds abroad, will obtain it in converted transports. The American manufacturer, who could not sell his finished products abroad nor obtain his raw materials from far countries during the war, knows he needs American ships, not only for the established trade, but, by means of a direct, high-class American service, to reach new customers, build new trade and hold it.

"In addition, and most important, a problem of living which touches closely every man, woman and child in the country is now tied up with our vessels. It is this: The foreign countries to which we have loaned billions of dollars will soon begin to repay us with articles manufactured abroad. A great flood of competition may inundate the country, causing many of our own mills and factories to go out of business. The only way to avert such a general calamity, is to be able to reship these goods to new foreign markets.

"In brief, we have been a nation of producers, but we must supplement that by becoming a nation of producers and distributors.

"For the moment we have the ships. But numbers of fine offices, well equipped, will not make a growing business. And we shall not long have ships, nor shall we ever be able to handle our own maritime affairs unless the strong sea spirit which made our fathers pre-eminent on the ocean shall again be awakened within us."

Those who attend the New York exhibition will have an excellent opportunity for observing this new spirit in America at first hand. The romance

of the sea as well as the commercial phases will be stressed not only at the exhibition itself but at the various banquets and public meetings which have been planned. At the Marine League banquet on Tuesday evening, April 13, August Belmont will preside, and Admiral Benson, chairman of the shipping board, will speak. Upon this occasion addresses will be made by D. F. Skinner, the noted shipbuilder from Seattle, and Capt. Irving L. Evans, director of the recruiting service of the shipping board. On Thursday, April 15, the Travel Club of America will hold a luncheon when the guest of honor will be Capt Robert A. Bartlett, Peary's famous navigator, who will give a talk entitled "With Peary at the Pole." He will be followed by Maj. Anthony Fiala with a talk on "With Roosevelt in Brazilian Jungles."

The public functions will be admirably supplemented by the exhibition itself in Grand Central Palace, where the curious minded and the sincere student will be able to make investigations. To the literary student the exhibition of the American Library association will prove of interest. This will include a shelf of what have been voted to be the best books relating to the affairs of the sea. A rare collection of models, made in 1905 by a New York firm, to prove the necessity for enlarging Ambrose channel in New York harbor, will be on view. The models depict the changes in construction of ocean going vessels from the period of the tiny sailing ships to the twentieth century steel

liners. Models of the transatlantic ships consist of the clipper ship DREADNOUGHT, and the steamships BRITANNICA, BORUSIA, ARIZONA, OCEANIA, and LEVIATHAN, and the dredge ATLANTIC, which was used in dredging the New York harbor. In addition, four authentic Hudson river models, selected to show the accurate differences in sizes of different periods, will be shown. These are the models of the CLERMONT, DANIEL DREW, MARY POWELL, and ROBERT FULTON. Among the curiosities will be a ship model carved by Robert Fulton himself. The authenticity of this model has been assured.

Intensifying the interest of the industrial and engineering expert will be the programs provided for engineering and fuel nights. These programs will be held in the theater in the exhibition building. On engineering night, Wednesday, April 14, lectures will be given by Walter McFarland on "The Use of Boilers for Generating Steam"; P. M. Robinson on "Turbines and Turbine Reduction Gears"; William T. Donnelly on "Inland Navigation", and by B. S. Beach on "Queen of the Waves." On fuel night, Friday, April 16, lectures will be given by Lindon C. Bates on "Colloidal Fuel"; Capt. Paul Foley on "The Bunkering Problem of the American Merchant Marine"; LeBaron S. Willard on "Coal and the Merchant Marine", and a special film showing the "story of oil" will be shown. This film has been loaned by the bureau of mines, Washington. The lectures and motion pictures on engineering and fuel night will begin promptly at 8 p. m.

### Program for Marine Week

**N**ATIONAL marine week, April 12-17, will be observed in connection with the national marine exposition at the Grand Central Palace, New York. The following program will be observed for the exposition. More than 190 exhibitors have reserved space. The exhibit will be open daily.

#### Monday, April 12

1 p. m., inaugural luncheon aboard an American ship in New York harbor, attended by secretary of commerce and chairman of the shipping board.

4 p. m., formal opening of National Marine exposition by chairman of the shipping board at Grand Central Palace.

8 p. m., shipbuilding night at exposition.

#### Tuesday, April 13

7 p. m., annual dinner of Na-

tional Marine league, Commodore hotel, New York.

#### Wednesday, April 14

8 p. m., engineering night. Lectures and motion pictures at exposition.

#### Thursday, April 15

8 p. m., travel night. "Travel in American Ships" featured at dinner under auspices of Travel Club of America.

#### Friday, April 16

8 p. m., fuel night. Lectures and motion pictures at exposition.

#### Saturday, April 17

1 p. m., merchant mariners' luncheon.

8 p. m., merchant mariners' night. Special films and features to stimulate recruiting of Americans for merchant service.



# Overheard at the Marine Show

**The Captain Explains Numerous Improvements That Make Seafaring Safe and Attractive—Harry Forms a New Opinion of Sea Life**



Square rigger getting under way outward bound. These vessels carried large crews and made fast time in a favorable wind

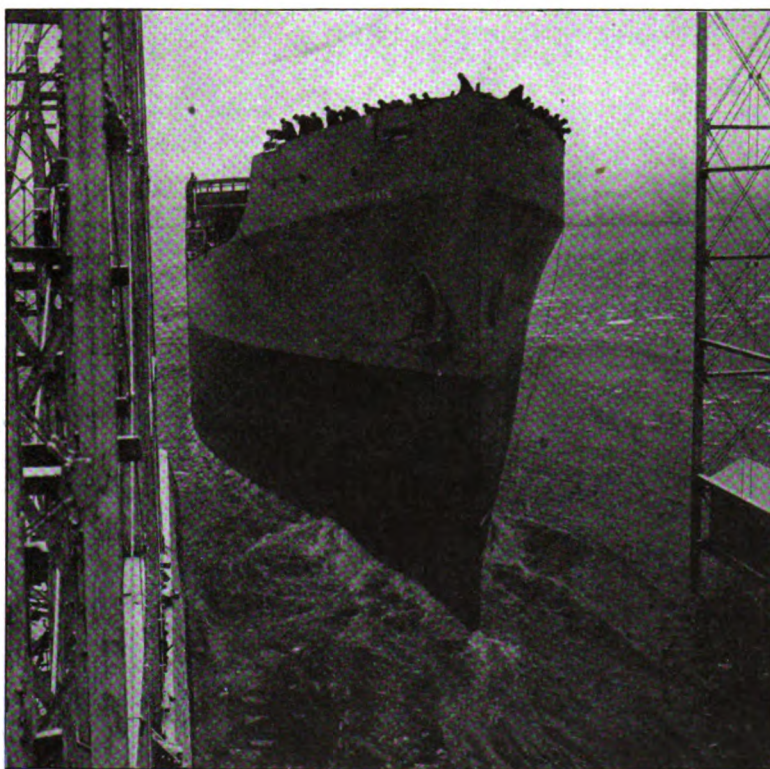
**C**APTAIN MARTIN leisurely worked his way down one aisle and up another at the National Marine exposition at the Grand Central Palace. As this was the first big exposition of marine appliances ever held in this country, he found much to interest him. Approaching 78 years of age, although he didn't look it, this veteran sea dog had seen the old merchant marine of the United States when it was near its prime. He had followed the sea since a young lad and at 25 he was a master mariner, commanding one of the fastest tea clippers that sailed out of Boston. He had seen the merchant marine in its glory and in the days following the Civil war he had witnessed its decline and decay. "Well, who would have thought it," he mused as he gazed on the scene about him. "All these improvements to help sailors and to promote commerce—looks as though the merchant marine is to regain its oldtime place." "Good morning, captain, how are you?" The captain turned to see who addressed him. "Well if it isn't Harry!" he exclaimed. "How are you

and how do you like the sea? I heard you had made several voyages in one of the shipping board vessels. Those ships are certainly fitted up like palaces compared with the windjammers of my younger days. I suppose you're an able seaman by this time or as near as you'll ever get to be one on a steam vessel." "Yes," Harry replied, "I've made some progress, to be sure, but I can't say as I like it, in some respects at least.

It isn't what it's cracked up to be, not by a good deal."

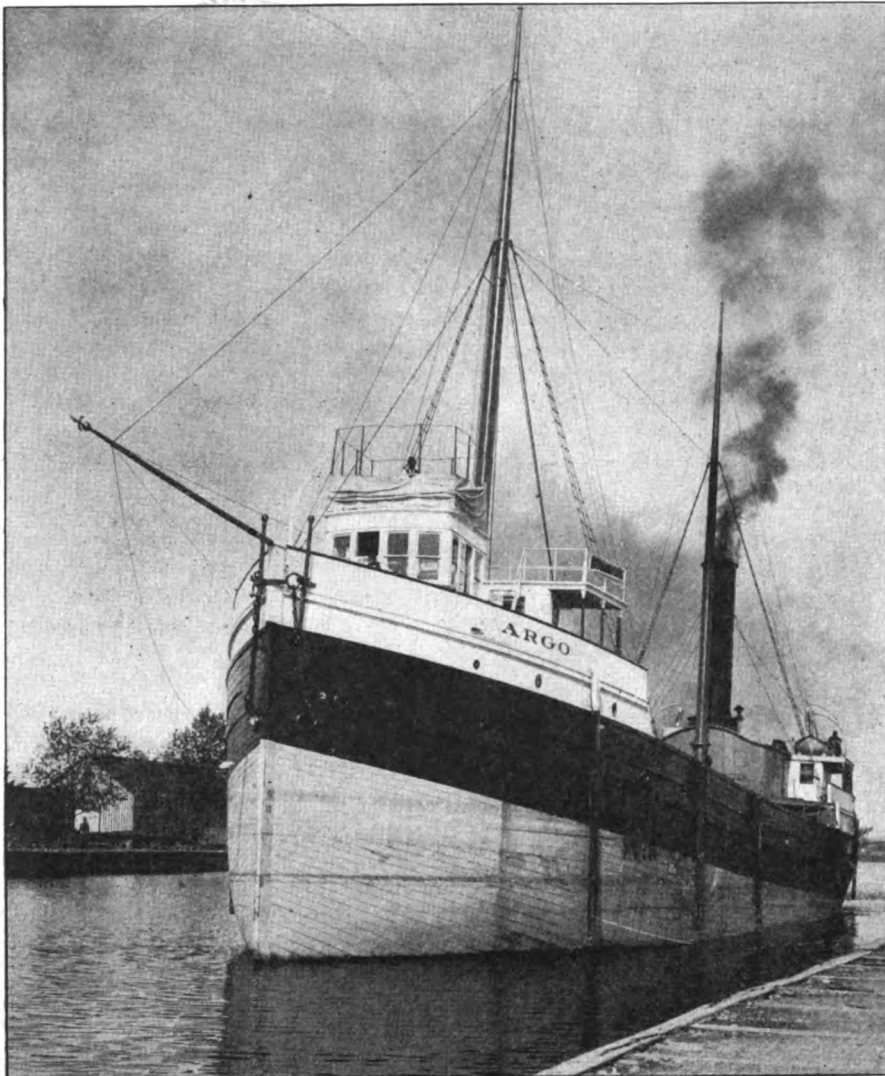
"What do you mean?"

"Well, it's this way. I read a lot of books about the sea when I was a kid, about the kind of ships you used to command, you know, and I thought a life at sea was the finest thing imaginable—but it isn't. Now on our last voyage we ran into a heavy northeaster—I never saw one like it—ship rolling and pitching at the same time, half of the crew sick and some of the officers, too. All we got to eat for three days was soup because the cook couldn't keep his pots and pans on the galley stove." The captain laughed tolerantly. "That's too bad, Harry, but you were lucky to get soup. Seems to me I remember worse times than that when I didn't get that much. You had a good ship and you weather the gale, so what's the difference." "Well," Harry rejoined, "it was a lot of inconvenience to put up with." "Boy, you fellows that go to sea don't know what inconvenience, as you call it, is. Now you're no lounge lizard, the type of individual that likes to sit around and



LAUNCH OF THE OLD NORTH STATE—THIS CRAFT IS TYPICAL OF SEVERAL 13,000-TON PASSENGER AND FREIGHT VESSELS BUILDING FOR AMERICAN LINER SERVICE





LAKE FREIGHTER OF A QUARTER CENTURY AGO—WOODEN STEAMER ARGO BUILT IN 1895

sip tea. You're a strong, husky chap and I'll bet you'll keep up your end of a rough and tumble fight with any man of your size. You're a nice one to talk of a few inconveniences like a little spell of heavy weather. That's part of the game. Now take a look at this exhibition with me. See all these contraptions? They were got up solely for one reason—to help along shipping and trade—to bring marine standards up as high as possible. These improvements make navigation safe. Why, son, it's almost fool proof by this time. It's these new innovations that make life easy for the seamen of today."

The captain drew a short briar pipe from his pocket while another pocket yielded a plug of thick, black tobacco. He eyed Harry speculatively as he opened his knife and whittled off a fill for his pipe. This he rolled between his palms, as only a seaman can, filled his pipe and lighted it. He smoked for a minute in silence and then continued:

"Harry, I want to show you a few

things that were got up to make life easy for you young fellows."

They strolled away, side by side, and

as they came in front of an oil company's exhibit, the captain stopped. "Harry," he began, "I never thought I would see the time when oil would be used as a ship's fuel but here it is. Just a little improvement to help you fellows along. Firing with coal is hard labor and, furthermore, it's dirty work. The use of oil saves labor and is cleaner."

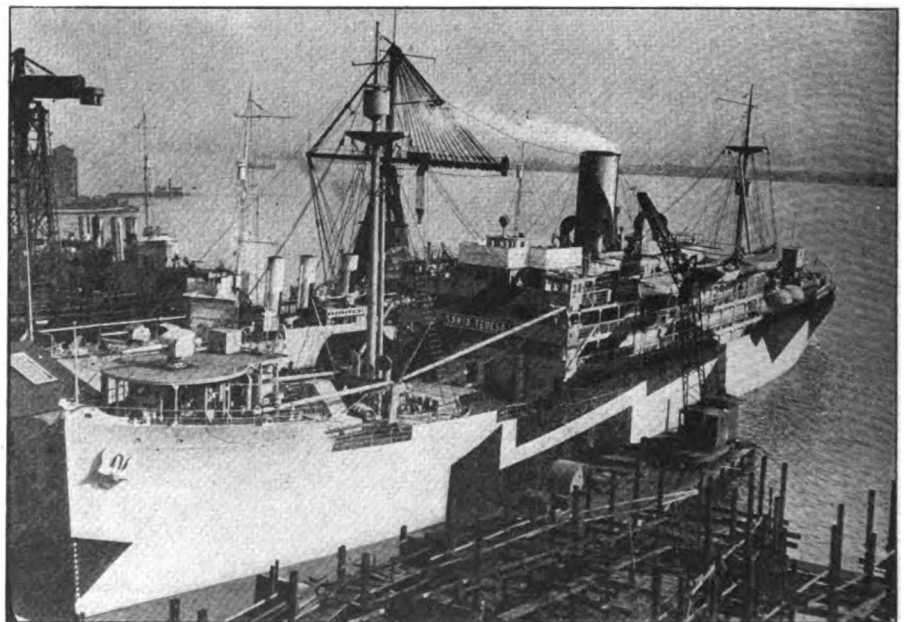
"But I'm no fireman," Harry protested.

"Even so," the captain replied with a grim smile, "someone else is. Somebody has got to get the coal out of the bunkers and on to the plates ready for the firemen. Then it's got to be shoveled in and the ashes shoveled out. It's hard work no matter who does it."

"Here's another improvement that helps you," the captain explained as they stopped before the booth of an anchor manufacturer. "With this stockless anchor all you do is just pull it up into a hawse pipe and there it is. In the old days when I used to sail, you had to cat and fish the anchor, get it inboard and stow it. And no steam engine to help you—all muscle work. Going to sea is a snap nowadays."

"Let's take a look at a few of these pretty instruments over here. All these devices were got up through painstaking effort to make navigation easy and safe. Here we see revolution counters for the engine room, helm indicators, whistle controls, logometers and other things too numerous to mention—all for your benefit, my boy."

"And look at this galley range especially designed to burn fuel oil. It makes cooking safe in rough weather for one thing and, again, it lightens the cook's labors to say nothing of



TROOPSHIP SANTA TERESA BUILT BY CRAMP YARDS IN 1918



furnishing the crew with well cooked meals.

"See that screen over there? See how it works? It simply revolves and keeps part of the pilot house window clean during rainy and snowy weather and the helmsman and the navigation officer have a clear view at all times. Many a good ship has been lost on account of an obscured view in attempting to navigate in thick weather. It's things of this kind that make navigation safe.

"A big propeller like this one is made in sections as you see. It is also carefully designed as to pitch so as to develop the most efficiency from a given amount of power. Improvements of this kind make navigation economical. That's one reason why you fellows today get such high wages compared to what they were in my younger days. The various improvements reduce the cost of transporting goods across the seven seas and so the shipping companies can afford to pay good wages.

"You may think it queer but, seeing that rope makes me recall that rope is as much a necessity aboard ship as it was in the days of sailing vessels. This concern supplies large quantities of Manila rope and they see to it that nothing but first class products are placed on the market.

Much depends on the strength of a piece of rope in critical times. Don't forget that my boy."

"Yes, I have begun to realize that," Harry replied. "Fire at sea is a terrible thing," the captain commented, "but see this stuff here? Well, it's a composition made along scientific principles for smothering a fire before it gets a chance to gain headway. I've seen good ships that could have been saved by a simple means such as you see before you at the present time. More improvements for your benefit, Harry. Painting as we used to do it in

my younger days was hard work," the captain commented as they examined a paint spraying apparatus. "Now with a device of this kind it's easy and saves a lot of hard work. All you have to do is to squirt it on with a hose."

"Yes," Harry commented, "I've done a little painting at sea. All seamen seem to be given that job once in a while, and I agree with you that some times it's hard work."

"Here's a pretty model," the captain

commented as they examined a model of a 5350 deadweight ton fabricated steel ship. "She represents a modern cargo carrier of the smaller type but just see the installations on her deck, placed there to lighten labor and then compare them with the methods followed in getting out cargo in my time. Some difference, my boy, and it's all done to save labor and time. Here also is a model of a shipyard, built to help win the war. American genius certainly came to the front in the time

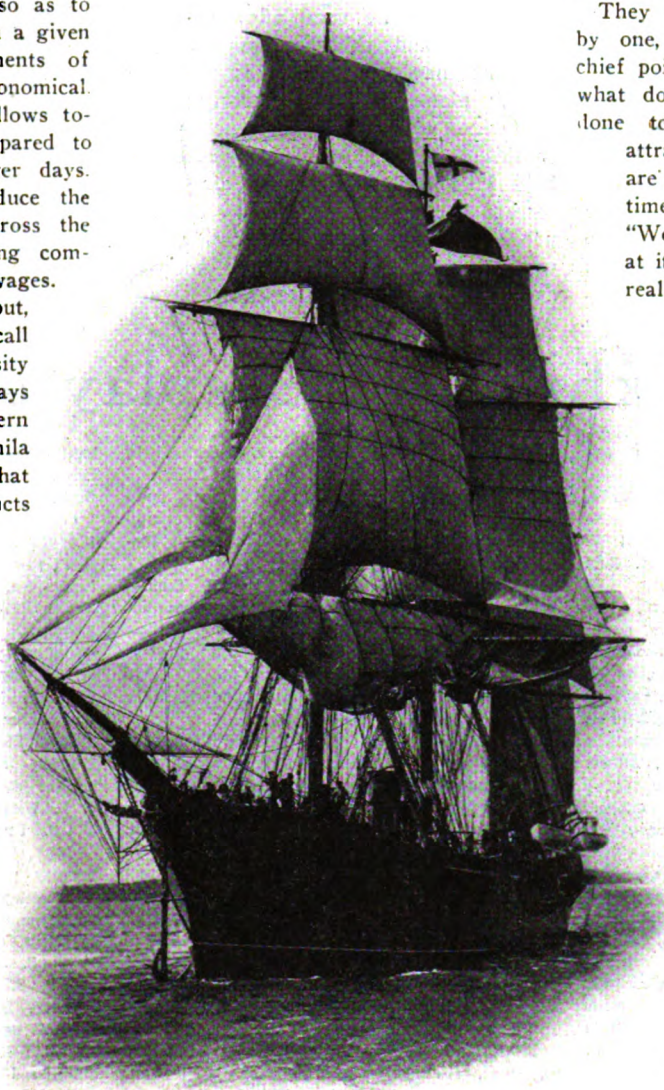
another or with a shore station in times of danger, permits the navigator to get his bearings in thick weather when he can't get a look at the sun, and when he hasn't seen the sun for several days to check up his dead reckoning with, so that his calculations are generally shot so full of holes he doesn't know where he is at. With wireless, you can get your bearings from a shore station and thus plot your position on the chart just as accurately as you could after working out an observation. It saves millions in money every year. That's a foregone conclusion."

They examined all the exhibits one by one, the captain pointing out the chief points of interest of each. "Now what do you think of what has been done to make navigation safe and attractive for you young men who are going to sea at the present time, Harry?" the captain asked. "Well, I'm beginning to look at it in a different light. Of course I realized that these improvements

existed, at least some of them, but I never stopped to think how they were all working for me." "Yes, Harry, at the present day, life at sea is easy compared with what it used to be. In the old days you lived in a dark stuffy fore-castle, furnished your own bedding, brought your own food from the galley and ate it out of a tin dish. You drank coffee and tea of exceedingly doubtful parentage out of a tin cup, sweetened with molasses, you got salt beef and hard tack oftener than you did anything else, worked hard and received small pay. Look at the difference today. You live in good quarters, are served the best of food, much better than the average man gets ashore, and you have a chance to work up in a short time. Ships' officers are well paid and there's a lack of them. Stick to it, my boy.

You've got to show me where you could do better ashore."

When the shipping board bark MOSHULU arrived in San Francisco recently from the Orient she reported that she was compelled to discharge 2000 tons of cargo at Hongkong and drydock at that port for cleaning. Her bottom was so foul that she handled slowly. In drydock, 50 tons of mussels were scraped from her planks.



HOMEWARD BOUND—TYPICAL WINDJAMMER GETTING UNDER WAY

of need. We got out the vessels and they served their purpose. And they are not half as badly constructed as the alarmists would have us believe."

"This wireless is a good thing, all right," Harry admitted as they approached another booth.

"You're right on that," the captain replied. "Without wireless telegraphy, navigation at the present time would be seriously handicapped. It enables one vessel instantly to communicate with



# Exhibits Show America's Power

Displays Reveal Magnitude Which Maritime Industry Has Attained—  
Results of Applying American Methods to Old Industry Are Disclosed

**I**MPROVEMENTS displayed at the National Marine exposition reflect the gradual development of marine engineering practice during the past quarter of a century, particularly in the past few years. Compared with what was accomplished in times past, this growth is little short of phenomenal. For centuries, new ideas in ship construction and operation were not looked upon with favor and worth while improvements gained ground but slowly. Thus, the main topsail clew lines on the *GREAT REPUBLIC*, as an illustration, were rove in exactly the same manner as those on the *VICTORY*, the *BONHOMME RICHARD* or the *CONSTITUTION*. Often hundreds of years lapsed without noticeable im-

provements being made to facilitate both the operation and safety of sailing vessels.

With the steady march of progress, however, a new order of things maritime, has come into being. Shipowners, shipbuilders and naval architects realize that the results of mechanical ingenuity can be used afloat as well as ashore and this accounts for the fact that navigation today is on a far higher plane than ever before.

Marine expositions are new—only to this country. The large exposition held in England last year did much toward focusing attention on the improved equipment, designed under the urge of war but now being adopted as rapidly as possible to the demands

of peaceful commerce. This exposition should accomplish as much for the American marine industry. The diversity of interests brought together in shipbuilding and operation is realized only partially by most Americans.

The National Marine exposition illustrates graphically the fact that American genius is showing its ability to reduce operating costs and conserve labor. The numerous innovations on exhibition are the result of many years of practical experimentation to provide the best for those who are engaged in the operation and building up of America's new merchant fleet. A study of the exhibits reveals the size which this revived industry has now attained.

## What Exhibitors Display at Show

**ADMIRAL ANCHOR CO.**, Philadelphia.—This company, with which the Penn Seaboard Steel Corp. and the Tacony Steel Co. have been consolidated, will exhibit anchors, naval equipment and marine castings. Represented by Craig Adair, Paul J. Driscoll, R. A. Cannon, William S. Haney, T. Burd Zell, William Baker and Paul Day.

**ALBERGER PUMP & CONDENSER CO.**, New York.—This company will exhibit air occluders, marine feed water heaters, expansion joints, steam turbines and automatic hydraulic boiler feed regulators.

**ALLISON & CO.**, Chester, Pa.—Motion pictures will be run showing the various manufacturing methods involved in making anchors. Represented by W. G. Seeley, W. M. Bateman and T. W. Allison.

**ALUMINUM COOKING UTENSIL CO.**, New York.—Cooking utensils for use aboard ships will be exhibited, such as steam jacketed kettles, coffee urns, etc. Represented by H. S. Trump.

**AMALGAMATED PAINT CO.**, New York.—Ship bottom compositions, marine paints and a number of ship models will be exhibited. Represented by L. A. D. Percival, Johan Elligers, Fred A. Percival and John A. Percival.

**AMERICAN CLAY MACHINERY CO.**, Philadelphia.—This company will exhibit a single-drum steam winch and a steam-drum type steering engine with steering column and wheel. Represented by H. D. Van Doorn and W. B. Fulmor.

**AMERICAN ENGINEERING CO.**, Philadelphia.—The company's exhibit will be devoted to all kinds of marine auxiliaries. Represented by W. H. Magee, P. E. Kriebel, R. Lamont and D. C. Spencer.

**AMERICAN MANGANESE BRONZE CO.**, Philadelphia.—Large built-up bronze propellers, bronze test pieces and samples, together with a number of photographs will be exhibited. Represented by C. R. Spare, T. H. Addle and C. J. Bower.

**AMERICAN MFG. CO.**, Brooklyn N. Y.—The company will exhibit a complete line of marine cordage together with samples showing the various steps through which rope progresses in the process of manufacture. Represented by F. W. Hackstaff, F. W. Phayre, John J. Reynolds, J. W. Ahlinger and others.

**AMERICAN NAVIGATOR LOG CORP.**, New York.—This company will exhibit a ship's log working

on the principle of a Pitot tube. Represented by M. C. Wilson, E. Berg, S. Platin and J. Jahle.

**AMERICAN STEEL FOUNDRIES**, Chicago.—Stockless anchors will be exhibited together with photographs and literature on marine steel castings. Represented by J. T. Rowbottom and A. Trevor Jones.

**ARGONAUT SALVAGE CORP.**, Milford, Conn.—The company will exhibit photographs, plans and models illustrating its method of locating and recovering sunken vessels and their cargoes. A tank will be installed to graphically illustrate by means of working models the raising of sunken vessels by the system devised by Simon Lake.

**ASHTON VALVE CO.**, New York.—Various types of marine pop safety valves, relief valves, gages, gage testing outfits and steam whistles will be shown. Represented by Charles W. Buckelew, C. W. Ulrick, H. O. Fettingier, William Henshall and Hugh Boyd.

**ATLANTIC-PACIFIC MFG. CO.**, Brooklyn, N. Y.—This company will exhibit life saving equipment such as life preservers, ring buoys, mattresses, cushions, etc., also ship fenders and spray hoods.

**BAKER, H. W., LINEN CO.**, New York.—A complete line of linens such as used by the steamship trade including table linen, stateroom linen, blankets, bedspreads, towelling, etc., will be displayed. Represented by L. C. Walker.

**BERNSTEIN MFG. CO.**, Philadelphia.—Stateroom equipment, steel lockers, beds, berths, bedding and steel ship equipment will be exhibited. Represented by William A. Weaver and Clarence E. Bates.

**BOUCHER, H. E., MFG. CO.**, New York.—The company will exhibit deck fittings and several models of well known vessels. The company is also the builder of a number of models that will be shown throughout the exhibition.

**BOWMAN, M. K.-EDSON CO.**, New York.—Electric trucks and photographs showing the company's factory interiors will be shown. Represented by R. L. Suydam.

**BRAMHALL, DEANE CO.**, New York.—The company's exhibit will consist of a galley range equipped to burn fuel oil. Also urns, warmers, presses and kettles will be shown. Represented by W. F. Wright and R. B. Tate.

**BROWN, A. JUDSON, & CO.**, New York.—Close and stud link chain, anchors, etc., will be shown,

together with blueprints and specifications of windlasses, winches, steering engines, pumps and port lights.

**CHADBURN (SHIP) TELEGRAPH CO. OF AMERICA, INC.**, Troy, N. Y.—This exhibit will comprise clear view screens, boiler feed circulators, electric tachometers, revolution indicators, salt detectors, course directors, deck coverings, steering pedestals, ships' telegraphs, binoculars, telescopes, engine counters, binnacles, compasses, sliding windows, voice pipe fittings and sounders. Represented by W. R. Chadburn, Thomas Arnold, G. C. Gregson, G. F. Greenhill and Charles Grayson.

**CLOTHIEL REFRIGERATING CO.**, New York.—Complete refrigeration machines and various units will be displayed. Represented by I. L. Rice Jr., J. L. Watson, A. C. Denslow, T. E. Carpenter and M. G. Farrer.

**CORY, CHARLES, & SON, INC.**, New York.—This company will exhibit a complete line of electrical ships' telegraphs for steering, docking, engine order, engine revolution, helm angle indications; mechanical telegraphs, electric lighting fixtures, etc. Represented by J. S. Jones, E. H. Weatherspoon, F. L. Novak and P. S. Grierson.

**CORY, HERBERT H., INC.**, Norfolk, Va.—A full line of supplies for the marine trade will be exhibited. Represented by Herbert H. Cory, R. E. Pelot, and G. C. Henderson.

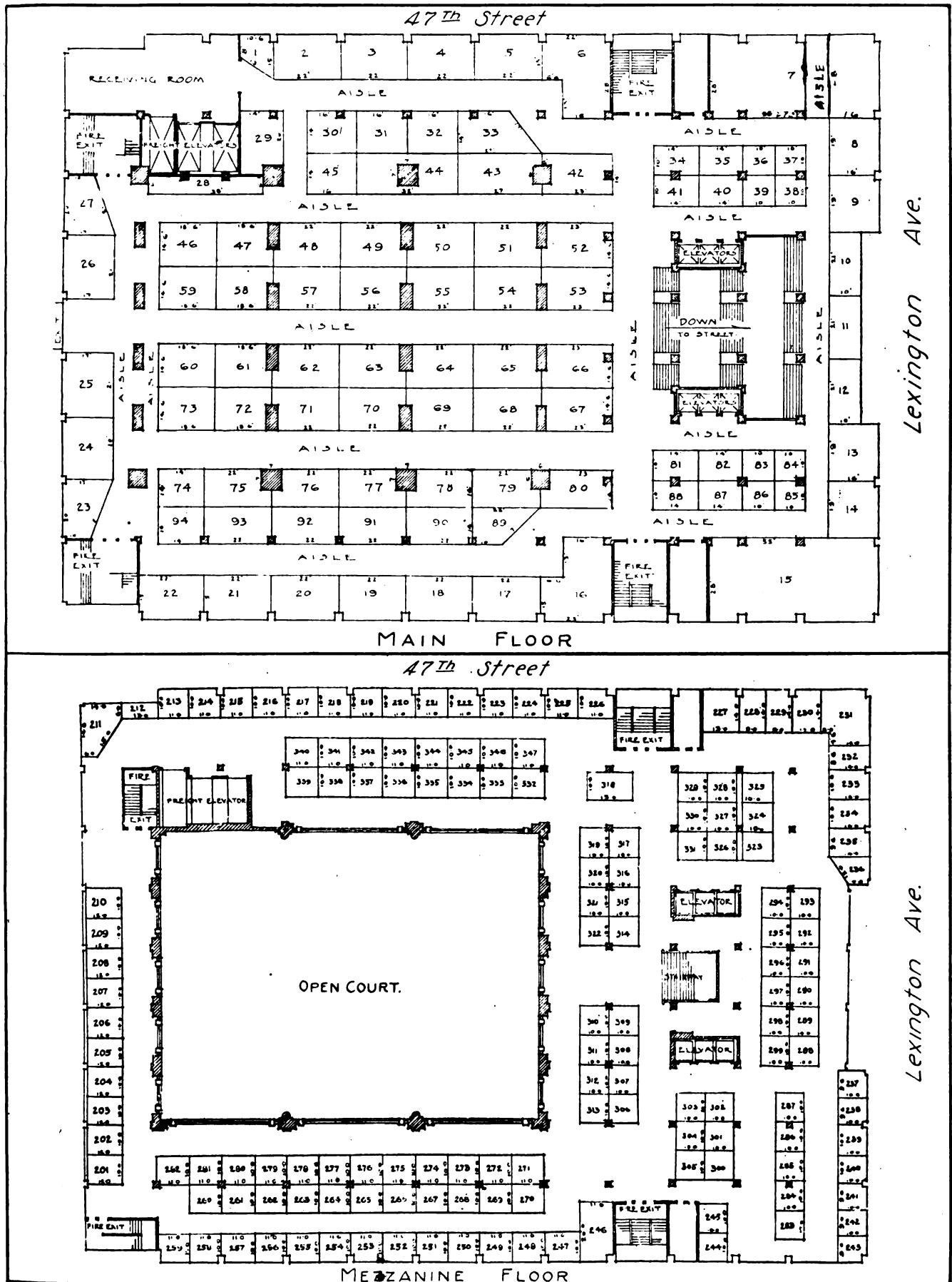
**CRANE CO.**, Chicago.—This company will exhibit a full line of valves and fittings for steam and water as used in marine equipment. Represented by J. F. Duffy, M. W. Link, G. E. Barker, J. H. Gelsa, R. Mitchell, E. Morgenthal, E. P. Ripley, E. W. Wilson, F. C. Bradbury.

**CUTLER-HAMMER MFG. CO.**, Milwaukee.—This company will exhibit a large number of photographs showing marine electrical installations and various types of electrical apparatus, panels, controllers, etc. Represented by H. L. Hibbard, Mr. Hetherington, Mr. Mittendorf and Mr. Cully.

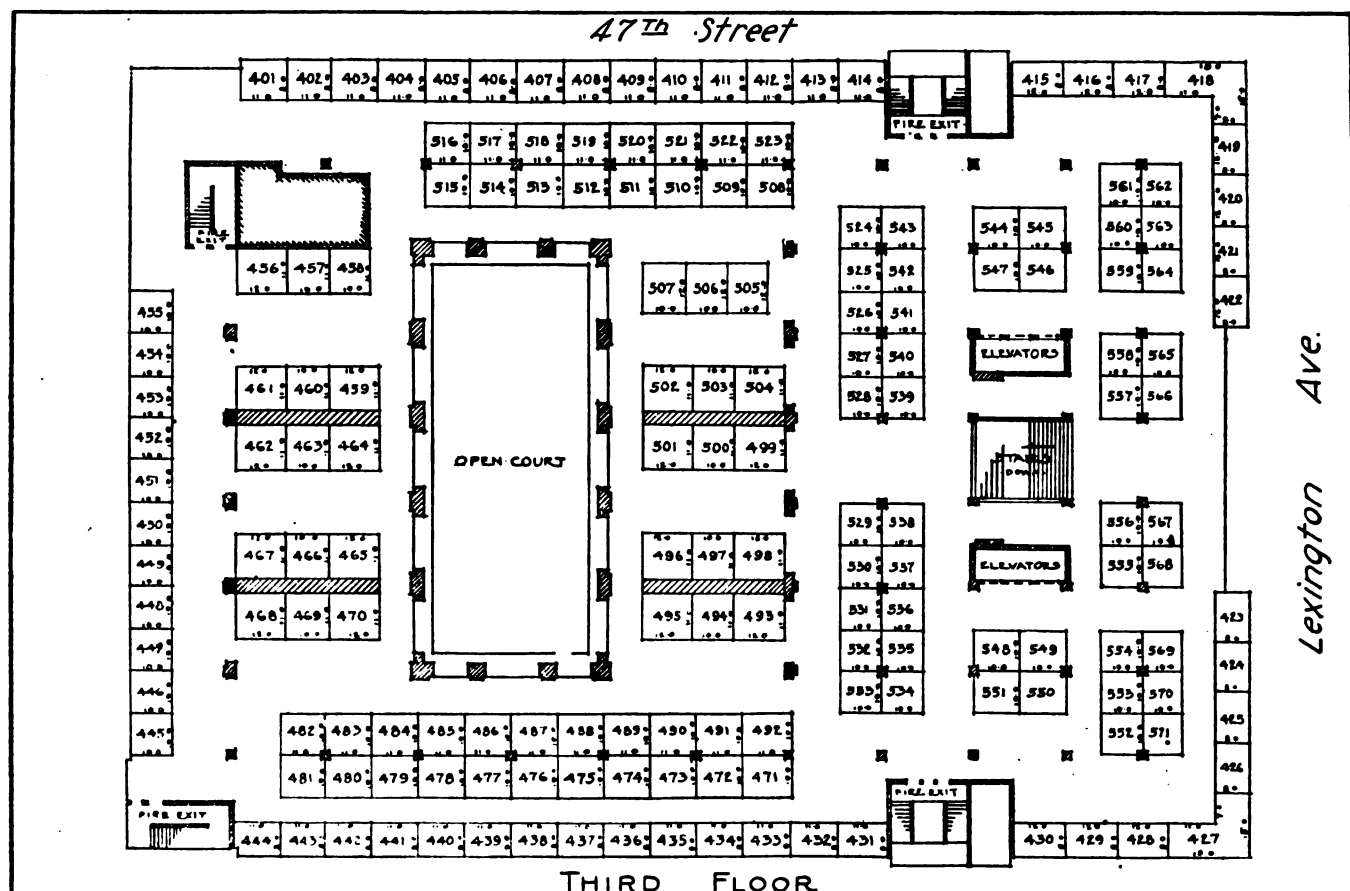
**CUTTING & WASHINGTON RADIO CORP.**, New York.—Complete radio apparatus will be exhibited. Represented by J. P. Johnston, E. H. Lewis, Bowden Washington, E. A. Gisburne, W. S. Graves, S. M. Moss and C. M. Kelley Jr.

**DE LAVAL STEAM TURBINE CO.**, Trenton.





UPPER DIAGRAM IS THE MAIN AND THE LOWER THE MEZZANINE FLOOR, GRAND CENTRAL PALACE, NEW YORK, AS ARRANGED FOR THE NATIONAL MARINE EXPOSITION



PLAN OF THE THIRD FLOOR, GRAND CENTRAL PALACE, AS ARRANGED FOR THE NATIONAL MARINE EXPOSITION

N. J.—Reduction gears, turbine driven boiler pumps, feed pumps, turbine driven circulating pumps and marine turbines will be exhibited. Represented by H. J. Kilroy, L. W. Friess, C. R. Waller and H. L. Watson.

DE VILBISS MFG. CO., Toledo, O.—This company's exhibit will consist of complete equipments for ship painting by the pneumatic spraying process. Represented by C. D. Ward, E. Frey and G. W. Trotter.

DIAMOND POWER SPECIALTY CO., Detroit.—The company's exhibit will consist of full size models of various types of soot blowers, samples of soot and test data. Represented by F. W. Leahy, M. J. Stack, W. P. Thomas and Robert June.

DODGE SALES & ENGINEERING CO., New York.—Internal combustion engines of one, two and three cylinders will be exhibited together with engine parts. Represented by S. A. Emery.

ELECTRIC ARC WELDING & CUTTING CO., Newark, N. J.—Appliances for use in arc welding such as electric welding handles, masks, shields, glasses and electrodes will be exhibited together with photographs showing the various classes of work to which the company's machines are applied. A practical demonstration of the company's welding equipment will also be conducted. Represented by J. J. Bellman, C. J. Holstag and E. S. Hurd.

ELECTROSE MFG. CO., Brooklyn, N. Y.—A complete line of insulators and insulating parts adapted for marine installations will be exhibited. Represented by Samuel Weiss.

FOAMITE FIREFOAM CO., New York.—This company will exhibit several types of fire extinguishing apparatus, together with descriptions and drawings of the company's fire extinguishing system. Represented by F. A. Epps, J. A. Allen, C. R. Smith and F. H. Steinicke.

GENERAL ELECTRIC CO., Schenectady, N. Y.—Motors, searchlights, switchboards, welding outfits and marine generator sets will be shown. Represented by E. O. Hunt, A. A. Ross, J. Anderson, W. E. Ver

Plank, W. J. Day, G. E. Young and L. W. Shugg.

GLOBE SHIPBUILDING & DRY DOCK CO. OF MARYLAND, Baltimore.—A large sized model of the company's yard will be shown together with models of vessels constructed by the company. Represented by R. C. Cooke, C. E. Danielson and W. E. Grass.

GOLD CAR HEATING & LIGHTING CO., New York.—Electric heaters for staterooms, foot warmers, heaters for bridges, lookouts, steam pressure reducing valves, steam inlet valves and ventilators will be exhibited. Represented by Edward E. Gold, E. B. Wilson, Harry C. Pollon and Charles W. Osborne.

IRVING IRON WORKS CO., New York.—This company will exhibit stairways, walkways and metallic flooring. Represented by W. E. Irving, P. L. Price, A. S. Kennedy, W. H. Low and H. H. Bunker.

JOHANSEN, H. S., New York.—This exhibit will comprise a surface ignition oil engine and an oil engine winch together with diesel engine data.

KAHNWEILER'S, DAVID, SONS, New York.—Life preservers, ring buoys, waterlights, line throwing guns, fenders, cushions, distress signals and sea anchors will be shown. Represented by Louis Kahnweiler.

KINGSBURY, ALBERT, Pittsburgh.—This exhibit will comprise a 14-inch marine type thrust bearing, marine 2-shoe bearing, large bearing showing exact equalization of load on all shoes and a small bearing arranged for inspecting lubrication action. Represented by Albert Kingsbury.

LAKE, SIMON, Milford, Conn.—Mr. Lake will show applications of the commercial submarine boat and some improved devices originated with the intention of speeding up shipbuilding. He will describe these devices personally.

LIDGERWOOD MFG. CO., New York.—Cargo winches will be exhibited under actual working conditions. Represented by Edward J. Boynton.

LINOTOL FLOORING CO., INC., New York.—Composition flooring in various designs and colors will be shown. Represented by Charles Schack, A. R. Buckwalter and C. W. Bauermeister.

LOCOMOTIVE SUPERHEATER CO., New York.—

A marine boiler with a fire tube superheater installed will be exhibited together with a full size cross section of a header showing the method of connecting the superheater units with the header. Represented by H. D. Oatley, G. E. Ryder, C. A. Brandt, J. A. Barnes, G. W. Kershaw and R. A. Holmes.

LUNKENHEIMER CO., Cincinnati.—Brass, iron and steel valves of all types used in marine installations will be exhibited, together with lubricators, whistles, ground key work and gas engine accessories. Represented by Walter Reynolds, Frank Hyatt, Edward Cooper, P. Smith, H. K. McCloughan and Andrew Lauterbach.

McNAB CO., Bridgeport, Conn.—Direction and revolution indicators, logometers, helm indicators, whistle controls and other special instruments will be shown. Represented by A. McNab, E. W. Eaton, H. P. Bull and H. B. Anderson.

MARINE REVIEW, THE, Cleveland.—This booth will be fitted up as a rest room and visitors are invited to make it their headquarters. Represented by John A. Penton, A. O. Backert, R. V. Sawhill, F. V. Cole, Leonard Drew, George D. Macdonald, V. G. Iden and D. Partridge.

MORSE DRY DOCK & REPAIR CO., Brooklyn, N. Y.—A model of the company's yard, model of the steamship SALINA, model of the company's largest dock and models of other vessels will be exhibited.

NEUBURGH SHIPYARDS, INC., Newburgh, N. J.—Large watercolor paintings of the company's first vessel built for the shipping board, the NEUBURGH, and the ORANCHO, a vessel recently built for the Cuyamel Fruit Co., will be exhibited, together with a full model of the latter craft. Represented by W. S. Wells.

NEW PROCESS CHEMICAL CO., INC., New York.—Marine glue, anticorrosive and antifouling paints will be exhibited.

NEW YORK ENGINEERING CO., New York.—This company will exhibit a complete model of its watertube 3-drum boiler.

OCEAN PAINT WORKS, New York.—Painted



## Where You Will Find Every Exhibitor

| Exhibitor   | No. of booth   | Exhibitor   | No. of booth       | Exhibitor  | No. of booth       |
|---|----------------|---|--------------------|--|--------------------|
| <b>MAIN FLOOR</b>                                     |                |   |                    |  |                    |
| Aldrich Publishing Co.....                            | 40             | Todd Shipyards Corp.....  | 78, 79, 80, 89, 90 | Lovell Co., W. H.....                                  | 289                |
| Allison & Co.....                                     | 61             | Travel Club of America.....                                     | 30                 | Luckenbach Line.....                                   | 337, 338           |
| Amalgamated Paint Co., Inc.....                       | 94             | United States Shipping Board.....                               |                    | MacFarlane, Ganey & Co.....                            | 299                |
| American Bureau of Shipping.....                      | 51             | .....8, 9, 10, 11, 12, 13, 14, 15, 16                           |                    | Mack Engineering Co.....                               | 264                |
| American Mast & Spar Co.....                          | 87             | United States Steamship Co.....                                 | 72                 | Marine Works.....                                      | 203                |
| American Manganese Bronze Co.....                     | 2              | Vulcan Iron Works, Inc.....                                     | 81                 | Maritime Register.....                                 | 204                |
| American Mfg. Co.....                                 | 50             | Wall Rope Works.....  | 42                 | Merchant Shipbuilding Corp.....                        | 267                |
| American Steel Foundries.....                         | 36             | Waterbury Co.....   | 34, 35             | Mississippi Wire Glass Co.....                         | 289                |
| Asbestolith Mfg. Co.....                              | 38             | Westinghouse Electric & Mfg. Co.....                            | 1/2 of 7           | Mott, J. L., Iron Works.....                           | 221, 222           |
| Baltimore Dry Docks & Ship Building Co.               | 56, 57         | Wheeler, C. H., Mfg. Co.....                                    | 49                 | Munson Steamship Co.....                               | 286, 287           |
| Bouche, H. S., Mfg. Co.....                           | 16             | Whitlock Cordage Co.....  | 53                 | National Hoisting Engine Co.....                       | 301                |
| Brunswick Refrigerating Co.....                       | 19, 20         | Wilson Welder & Metals Co., Inc.....                            | 25                 | Nautical Gazette, Inc.....                             | 333                |
| Camden Forge Co.....                                  | 75, 76         | <b>MEZZANINE</b>  |                    |  |                    |
| Camp S'ims.....                                       | 85             | Alberger Pump & Condenser Co.....                               | 316                | Neptune Ship Supply Co.....                            | 206                |
| Chadburn (Ship) Telegraph Co. of America              | 93             | Aluminum Cooking Utensil Co.....                                | 343                | New Process Chemical Co.....                           | 347                |
| Coen Co.....  | 8              | American Blower Co.....   | 335                | New York Engineering Co.....                           | 233                |
| Columbian Bronze Corp.....                            | 17             | American Car & Foundry Co.....                                  | 344, 345           | Ocean Paint Works, Inc.....                            | 205                |
| Columbian Rope Co.....                                | 52             | American Clay Machinery Co.....                                 | 217, 218, 219, 220 | Olto, Albert T., & Sons, Inc.....                      | 347                |
| Cory, Charles, & Son, Inc.....                        | 84             | American Engineering Co.....                                    | 209, 210           | Pantasote Co.....                                      | 251, 252           |
| Crane Co.....   | 68, 69         | American Marine Paint Co.....                                   | 312                | Peterson, K. G.....                                    | 213                |
| Cutler-Hammer Mfg. Co.....                            | 70             | American Navigator Log Corp.....                                | 320                | Pneumercator Co., Inc.....                             | 215, 216           |
| Cutting & Washington Radio Corp.....                  | 1              | American Standard Shipfittings Corp.....                        | 325                | Poole Engineering Co.....                              | 280                |
| DeLaval Separator Co.....                             | 44             | Argonaut Salvage Corp.....                                      | 274                | Reading Valve & Fitting Co.....                        | 326                |
| DeLaval Steam Turbine Co.....                         | 91, 92         | Arnesto Paint Co., Inc.....                                     | 249                | Row & Davis, Inc.....                                  | 211                |
| Dodge Sales & Engineering Co.....                     | 31             | Ashton Valve Co.....  | 282                | Shipbuilding & Harbor Construction.....                | 203                |
| Electro Mfg. Co.....                                  | 20             | Astoria Boat Works.....   | 259                | Shipbuilding Products Mfg. Co.....                     | 298                |
| Fuller, George A., Co.....                            | 1/2 of 7       | Atlantic & Pacific Mfg. Co.....                                 | 319                | Shipmasters' Club.....                                 | 348                |
| General Electric Co.....                              | 5, 6           | Baker, H. W., Linn Co.....                                      | 331                | Simpson Godon Patents, Inc.....                        | 254                |
| Globe Shipbuilding & Dry Dock Co. of Maryland         | 3              | Beaver Tile & Specialty Co.....                                 | 256                | Sinclair Refining Co.....                              | 300                |
| Hoover, Owens, Rentschler Co.....                     | 63             | Bendus, J. V., & Co.....  | 348                | Smith's Port Publishing Co.....                        | 328                |
| Hyde Windlass Co.....                                 | 22             | Benjamin Electric Mfg. Co.....                                  | 234                | Standard Oil Co. of New York.....                      | 308, 309, 310, 311 |
| International Mercantile Marine Co.....               | 15             | Bernstein Mfg. Co.....  | 303, 304           | Staten Island Shipbuilding Co.....                     |                    |
| Irving Iron Works Co.....                             | 74             | Bramhall, Deane Co.....   | 247                | .....314, 315, 321, 322                                |                    |
| Kingsbury, Albert.....                                | 33             | Brooklyn Y. M. C. A.....  | 301                | Sturtevant, R. F., Co.....                             | 275, 276           |
| Lake, Simon.....                                      | 273            | Bowman, M. K.-Edson Co.....                                     | 250                | Texas Co.....  | 292, 293           |
| Lidgerwood Mfg. Co.....                               | 43             | Brown, A. Judson, & Co.....                                     | 302                | Topping Brothers.....                                  | 259                |
| Locomotive Superheater Co.....                        | 48             | Buzzini, Walter J., Inc.....                                    | 284                | Triplex Safety Glass Corp. of America.....             | 323                |
| Lunkenheimer Co.....                                  | 54             | Callophone Co. of N. Y.....                                     | 342                | Turbine Air Tool Co.....                               | 305                |
| McNab Co.....   | 4              | Campbell, G. W.....   | 232                | Union Sulphur Co.....                                  | 255                |
| Mallory Industries, Inc.....                          | 55             | Clothel Co.....   | 295, 296           | United Marine Contracting Corp.....                    | 343, 344, 345      |
| Marine News.....                                      | 88             | Cory, Herbert H., Inc.....                                      | 282                | Upson-Walton Co.....                                   | 227                |
| MARINE REVIEW, THE.....                               | 45             | Crandall Engineering Co.....                                    | 281                | Uttmark's Nautical Academy.....                        | 253                |
| Morse Dry Dock & Repair Co.....                       | 46, 47, 58, 59 | Deleo Light & Products Co.....                                  | 246                | Valentine & Co.....                                    | 257                |
| Motorship.....  | 28             | Department of Parks and Public Property, Jersey City, N. J..... | 339, 340           | Virginia Iron Works, Inc.....                          | 306                |
| National Marine Engineers Beneficial Association..... | 24             | DeVilbiss Mfg. Co.....  | 313                | Wagar Furnace Bridge Wall Co., Inc.....                | 221, 232           |
| Neptune Association.....                              | 41             | Devoe & Reynolds Co., Inc.....                                  | 329, 330           | Walles Dove-Hermiston Corp.....                        | 336                |
| Newburgh Shipyards, Inc.....                          | 27             | Diamond Power Specialty Co.....                                 | 223                | Waltham Watch Co.....                                  | 265                |
| Oxweld Acetylene Co. of N. J.....                     | 21             | Donnelly, William T.....  | 266                | White, Kelvin & Wilfrid O., Co.....                    | 279                |
| Penn Steel & Wire Co.....                             | 39             | Downey Shipbuilding Corp.....                                   | 269, 270, 271, 272 | Williams, William E.....                               | 307                |
| Penn Seaboard Steel Corp.....                         | 36             | Duparquet Hunt & Moneuse Co.....                                | 237                | Williams & Wells Co.....                               | 290                |
| Penton Publishing Co.....                             | 45             | Durkee, Charles D., & Co.....                                   | 328                | Winner Co.....   | 212                |
| Power Boating.....                                    | 45             | Electric Arc Cutting & Welding Co.....                          | 208                | Wireless Specialty Apparatus Co.....                   | 281                |
| Power Specialty Co.....                               | 37             | Electric Service Supply Co.....                                 | 207                |  |                    |
| Reld, John, & Co.....                                 | 16             | Foamite Firefoam Co.....  | 224                | <b>THIRD FLOOR</b>                                     |                    |
| Schutte & Koerting Co.....                            | 62             | Gold Car Heating & Lighting Co.....                             | 226                | American Red Cross (Insular and foreign division)..... | 526                |
| Shipping Publishing Co., Inc.....                     | 32             | Guarantee Exterminating Co.....                                 | 294                | Boston Engineering Co.....                             | 534                |
| Simmons-Boardman Publishing Co.....                   | 82             | Hamilton & Hansen.....  | 229                | City of New London.....                                | 528                |
| K-C Welding & Cutting Co., Inc.....                   | 225            | Hansen & Yorke Co., Inc.....                                    | 324                | Electric Tachometer Corp.....                          | 532                |
| Skinner & Eddy Shipbuilding Co.....                   | 64, 65         | Hubbard, Charles, & Co.....                                     | 202                | France Packing Co.....                                 | 537                |
| Sperry Gyroscope Co.....                              | 71             | Industrial & Sales Corp.....                                    | 248                | International Magazine Co.....                         | 540                |
| Steward Davit & Equipment Corp.....                   | 66, 67         | International Nickel Co.....                                    | 260                | New York & Cuba Mail S. S. Co.....                     | 505                |
| Submarine Boat Corp.....                              | 60, 73         | Johannsen, H. S.....  | 236                | Oh'o Body & Blower Co.....                             | 539                |
| Thorsen, P. S., & Co.....                             | 77             | Johnson Shipyards Corp.....                                     | 213, 214           | Palge & Jones Chemical Co.....                         | 536                |
| Tiebout, W. & J.....                                  | 83             | Kahnweiler's, David, Sons.....                                  | 278                | Phillips, F. R., & Sons Co.....                        | 555, 556, 557, 558 |
|   |                | Leslie-Stevens Co., Inc.....                                    | 268                | Philippine Commercial Agency.....                      | 533                |
|   |                | Leslie Co.....  | 291                | Shoenberg, I., Inc.....                                | 548                |
|   |                | Linnet Flooring Co.....   | 341                | Thorne-Pioneer Co., Inc.....                           | 524                |

slabs, raw materials entering into the manufacture of paint and finished paints will be exhibited. Represented by C. A. Osterholm, J. H. Adams, J. A. Johnson, H. R. Stevens, W. Lindberg, F. Lindberg, J. Gatehouse, J. Osterholm, W. Waters and Miss V. Hannigan.

OXWELD ACETYLENE CO., Newark, N. J.—A complete line of the company's low pressure welding and cutting apparatus and samples of welding and

cutting work will be exhibited. Represented by L. E. Ogden, W. E. Cotter, H. C. Lauderback, F. M. Mather, F. W. Mittenmeyer, F. W. Barney, Carl Olson and Frank Geibig.

PENN SEABOARD STEEL CORP.—See Admiral Anchor Co.

PENTON PUBLISHING CO., Cleveland.—This booth will be fitted up as a rest room and visitors are invited to make it their headquarters. Represented

by John A. Penton, A. O. Backert, R. V. Sawhill, F. V. Cole, Leonard Drew, George D. Macdonald, V. G. Iden and D. Partridge.

PNEUMERCATOR CO., INC., New York.—Draft gages, tank gages, fore and aft gages, etc., will be shown. Represented by William Thomas.

POWER BOATING, Cleveland.—This booth will be fitted up as a rest room and visitors are invited to make it their headquarters. Represented by John

A. Penton, A. O. Backert, R. V. Sawhill, F. V. Cole, Leonard Drew, George D. Macdonald, V. G. Iden and D. Partridge.

POWER SPECIALTY CO., New York.—This company will exhibit a superheater. Represented by J. J. Nells, J. C. McKenzie and F. Glander.

READING VALVE & FITTINGS CO., Reading, Pa.—Open hearth steel flanges and threaded fittings in standard, medium and heavy designs will be exhibited. Represented by M. G. Moore, A. J. Haines and C. F. Lidstone.

SHIPBUILDING PRODUCTS MFG. CO., New York.—This company will exhibit steering wheels and chains and drawings of various kinds of marine equipment. Represented by R. D. Ewell, J. Gibson Ewell and R. S. Ewell.

SKINNER & EDDY SHIPBUILDING CO., Seattle.—This shipyard will exhibit two models of ship-building machines, a scarfing machine and a pneumatic ram, a bolting up machine and paintings of several of the company's vessels.

SPERRY GYROSCOPE CO., Brooklyn, N. Y.—A gyroscope compass and a working model of the company's ship stabilizer will be exhibited together with a ship's log and a low water alarm.

STEWART DAVIT & EQUIPMENT CORP., New York.—This company will exhibit mechanical davits, lifeboat falls, controllers, releasing devices, lifeboat roller carriages, and complete lifeboats. Represented by R. B. Steward, H. B. Hills, Capt. John F. Blain, Capt. A. T. Hunter, L. S. Zider, H. H. Ropke and K. Joseph.

SUBMARINE BOAT CORP., Newark, N. J.—An

accurate model of the 5350-ton type fabricated steel ship built by the company for the shipping board will be exhibited with a model of the company's shipyard.

TACONY STEEL CO.—See Admiral Anchor Co.

TEXAS CO., New York.—Samples of marine oil will be shown. Represented by Frank J. Shipman, D. P. Quinn, L. O'Malley, L. A. Wilson, E. I. Decker and A. St. James.

TIEBOUT, W. & J., New York.—Ship locks, knobs, door hooks, butts, berth room fittings, deck fittings, turnbuckles and ship joiner hardware will be exhibited. Represented by John Tiebout Jr.

TOPPING BROS., New York.—Ship hardware, ball bearing jacks and dry dock supplies will be exhibited. Represented by W. C. Chamberlain and J. N. Topping.

TRIPLEX SAFETY GLASS CORP. OF AMERICA, New York.—Portlights and glass for marine use of various kinds will be exhibited. Represented by A. Kennedy Child, William J. Finlay and H. P. Teare.

TURBINE AIR TOOL CO., Cleveland.—Air operated planers and drills will be shown. Represented by George L. Kraber, Maj. F. W. Nichol, Col. Walter L. Bell, G. A. Miller, Stephen J. McPartland, H. H. Bowtell and J. B. Millet.

UPSON-WALTON CO., Cleveland.—A complete line of nautical instruments, wire rope and vessel fittings of various kinds will be shown. Represented by John H. Roys, Edwin H. Parker, C. A. Reichelderfer, Frank H. Hemler and Wade H. McKee.

WALL ROPE WORKS, INC., New York.—Raw materials, finished products, photographs showing

manufacturing operations and sections of large hawsers will be exhibited. Represented by C. D. Shropshire.

WALTHAM WATCH CO., Waltham, Mass.—This company will exhibit marine chronometers and marine clocks together with a few ladies' wrist watches, men's watches, leather travelling clocks, mirror clocks, wall clocks, banjo clocks, hall clocks, mantel clocks and boudoir clocks. Represented by Fred A. Wilson, E. J. Steele and John M. Kelsey.

WATERBURY CO., New York.—Fiber and wire rope will be exhibited. Represented by R. G. Richmond, J. A. Blair and E. C. Butler.

WHEELER, C. H., MFG. CO. Philadelphia.—This company will exhibit condensers, pumps, feed water heaters and water cooling apparatus. Represented by G. L. Kothny, Charles Lang, J. Mullin and others.

WHITLOCK CORDAGE CO., New York.—A representation of a dock scene looking out to a parade view of the Atlantic fleet led by the U. S. S. PENNSYLVANIA will be shown, together with a full line of marine cordage. Represented by D. W. Lapham, L. I. Whitlock, J. J. Campbell, C. Brown and F. X. du Tremblay.

WINNER CO., New York.—The company's steam trap will be exhibited. Represented by Allen A. Smith, Thomas W. Monahan and R. Fruesen.

WIRELESS SPECIALTY APPARATUS CO., Boston.—A complete line of radio equipment suitable for all types of ships will be shown, together with peloruses. Represented by Walter J. Henry.

## Condensed Reviews of Latest Books

*Model Making*, by Raymond Francis Yates, cloth; 390 pages, 5½ x 8½ inches, published by the Norman W. Henley Publishing Co. and furnished by THE MARINE REVIEW for \$3.

No trade is more fascinating, in all probability, than the art of making models. Here the handicraftsman has ample opportunity to exercise his talents in many lines. The volume under discussion does not treat with the construction of toys. On the other hand, its pages are devoted to model engineering of the highest development. It is profusely illustrated and contains descriptions of complete working models made by famous model makers throughout the country.

The first part of the book is devoted to the mechanical arts and processes relating to the general application of model engineering. This section is of practical value to the inexperienced man who wishes to make practical models but is not always familiar with the process employed. Many short cuts and practical helps are also included for the practical model maker.

A complete treatise on the art of making patterns for models is included and the use of abrasive materials is described in detail.

Of special interest to those engaged in maritime pursuits is a complete description showing just how to make a 4-foot model of a Great Lakes, bulk

freighter. This craft is propelled by a 2-cylinder engine which takes steam from a horizontal gasoline-fired boiler. Among other models described are steam engines of various types, steam plants, hydroplanes, power boats, subchasers, submarines, locomotives, tanks and siege guns.

*Submarines and Sea Power*, by Charles Domville-Fife, cloth; 245 pages, 5½ x 8½ inches; published by the Macmillan Co. and furnished by THE MARINE REVIEW for \$2.50.

As the great war retreats into history, many of its lessons are becoming obscured. In this volume, the author makes a plea for a thorough study of the submarine as a vessel of offense and defense. If Germany had paid as much attention to naval development as she did to that of her army, history might have been written differently today. Mr. Domville-Fife points out that the maintenance of an adequate submarine fleet is of vital importance to any maritime nation and that a thorough understanding of submarines is necessary to meet the emergencies of possible future conflicts. An interesting chapter is devoted to the cruisers of today and the battleships of tomorrow.

The author draws attention to the fact that the submarine is a dangerous factor to deal with because it can remain invisible and thus strike a fatal

blow to the mightiest battleship afloat. Inherent weaknesses of the submarine are also set forth and the author draws the conclusion that either the submarine will remain in its present state or grow greatly in size to the point where it can establish an effective command.

The author begins by tracing the growth of the submarine from the earliest records in 1578 down to the present day. Several pages are devoted to this history. Next is given an account of the development of the submarine by great naval powers. The activities of Great Britain, France, Russia, the United States, Germany, Austria, Italy and Japan are set forth in detail.

In describing antisubmarine warfare, the author discloses in detail what steps were taken during the recent war to combat the submarine menace. Other chapters describe the effect of the submarine on naval strategy, the conversion of inferior into superior force, submarine's influence on specified operations of naval warfare, effect of the submarine on the duties of battleships, cruisers and destroyers, limitations of submarine attack, problems of submarine navigation, submarine tactics, etc. A chapter devoted to the history of the submarine mine and its effect on naval warfare is especially interesting.



# Practical Navigation Guide-I

Explanation of Nautical Measures and How a Course Is  
Checked by Dead Reckoning for Latitude and Longitude

BY V. G. IDEN

**T**HE object of navigation is to locate as accurately as possible the position of a ship at sea at any particular instant. Obviously, the first requirement is to know the distance sailed. The log line is the first and prime instrument designed for the purpose of making such a measurement. With the advent of steam and improved propulsion machinery the distance can be measured by the revolutions of the propeller.

The measure of distance at sea is, however, different from the measure of distance on land. The equator is an imaginary line around the center of the earth, each point on which is equidistant from either pole. Lines drawn parallel to the equator are parallels or latitude. From the equator to the pole is 90 degrees, each degree being subdivided into 60 minutes and each minute subdivided into 60 seconds. The meridinals of longitude are imaginary lines drawn around the earth, each passing through the two poles. For the convenience of navigators, the meridinal longitude passing through Greenwich, England, is accepted as the prime meridinal of longitude. Longitude is also measured by degrees, minutes and seconds. The longitude

which is 180 degrees from the prime meridinal longitude is, naturally, on the opposite side of the earth from the longitude of Greenwich. The equatorial axis of the earth measures 7927 miles, while the polar axis is 7900 miles. The nautical mile is one minute of longitude on the equator or one minute of latitude measured on the meridian. Measured on the equator one minute is 6080 feet, which in America is commonly known as the measure of a nautical or sea

mile. As a ship proceeds north or south of the equator the distance between longitudes decreases, and becomes zero at the poles.

The compass is an instrument as essential to the navigator as any on board ship. By means of this instrument, the direction sailed, or to be sailed, is reckoned. The old mariners' compass was laid off in points. From due north to due east or due west was 90 degrees. From due south to due east or due west was also 90 degrees. The new compass adopted by the United States navy, which is growing in popularity among American navigators on all types of vessels, is divided into 360 degrees beginning with 0 degree at north to 360 degrees back to north. The points of the compass, therefore, are as follows:

| Compass points | Old compass reading | New compass reading |
|----------------|---------------------|---------------------|
| N              | 0°                  | 0°                  |
| N-by-E         | N 11° 15' E         | 11° 15'             |
| NNE            | N 22° 30' E         | 22° 30'             |
| NE-by-N        | N 33° 45' E         | 33° 45'             |
| NE             | N 45° E             | 45°                 |
| NE-by-E        | N 56° 15' E         | 56° 15'             |
| ENE            | N 67° 30' E         | 67° 30'             |
| E-by-N         | N 78° 45' E         | 78° 45'             |
| E              | 90° E               | 90°                 |
| E-by-S         | S 78° 45' E         | 101° 15'            |

|         |             |          |
|---------|-------------|----------|
| ESE     | S 67° 30' E | 112° 30' |
| SE-by-E | S 56° 15' E | 123° 45' |
| SE      | S 45° E     | 135°     |
| SE-by-S | S 33° 45' E | 146° 15' |
| SSE     | S 22° 30' E | 157° 30' |
| S-by-E  | S 11° 15' E | 168° 45' |
| S       | 0°          | 180°     |
| S-by-W  | S 11° 15' W | 191° 15' |
| SSW     | S 22° 30' W | 202° 30' |
| SW-by-S | S 33° 45' W | 213° 45' |
| SW      | S 45° W     | 225°     |
| SW-by-W | S 56° 15' W | 236° 15' |
| WSW     | S 67° 30' W | 247° 30' |
| W-by-S  | S 78° 45' W | 258° 45' |
| W       | 90° W       | 270°     |
| W-by-N  | N 78° 45' W | 281° 15' |
| WNW     | N 67° 30' W | 292° 30' |
| NW-by-W | N 56° 15' W | 303° 45' |
| NW      | N 45° W     | 315°     |
| NW-by-N | N 33° 45' W | 326° 15' |
| NNW     | N 22° 30' W | 337° 30' |
| N-by-W  | N 11° 15' W | 348° 45' |
| N       | 0°          | 360°     |

In plain sailing upon a fixed course, it is comparatively easy to estimate the direction by use of the compass. Inasmuch as the compass is most likely one which points only to the magnetic pole, it will show a variation from the true direction which will differ for different localities. Often the compass is affected by magnetic metal in the ship itself, or, if a gyroscopic compass, it will be affected by the speed of the ship. This is recognized as compass deviation. Both

variation and deviation should be known and taken into account when estimating the true course of the ship. When figuring the deviation and the direction indicated by the compass, care should be taken to remember that when either the deviation or variation is westerly it is subtracted from the compass direction, and when easterly it is added to that direction. For instance suppose the compass pointed due east on a particular course and it is known that the

## Opportunities for the Progressive Seaman

**T**HIS is the first of a series of articles on practical navigation. The object of adding anything new to the science of navigation has not been sought, but instead the hope is held that they offer a short, comprehensive guide for the practical seamen. The layman has been led to believe that it is not necessary for the ordinary seaman to understand navigation but this is a fallacy. The true American idea is to make the most of opportunities that are offered and if American boys are to take to the sea, they should be assured of every opportunity of advancing in their chosen profession.

For the average seaman to keep aboard for quick reference the various books needed for the study of navigation is a difficult problem at best. Thus, it is hoped that these articles will serve as a convenient course in navigation that can be referred to at odd moments. These articles will impart the necessary knowledge of navigation needed to equip a man to pass his examination as junior officer. The articles also will include all phases of navigation that are required of a man applying for a master's certificate under United States laws.

Acknowledgement is gladly extended to Capt. Robert Huntington, dean, and E. T. Woodworth, head instructor in marine navigation, of the Seamen's Church Institute School of Navigation and Marine Engineering, New York, for their able counsel and advice in the preparation of these articles.

compass had a variation of 5 degrees westerly, and a deviation of 10 degrees easterly. The direction due east would be 90 degrees from north. To this should be added the 10 degrees of easterly deviation, making 100 degrees, which would be the magnetic course. From this should be subtracted the 5 degrees of westerly variation, leaving 95 degrees as the true course. This would be 95 degrees by the new compass, which is 5 degrees south of east or 85 degrees east of south. According to the old compass the direction would be south 85 degrees east.

This would be the true course of the ship had there been no wind or had the wind been directly fore or aft where it would not affect the course of the ship. If the wind is on the quarter or amidships and is blowing strong it will have

the ship and the distance traversed is measured. In many modern vessels speed is reckoned by the number of revolutions of the propeller (minus the percentage of slip). Fig. 1 illustrates the course which is under discussion. The ship started from *A* and sailed to *B*, and the distance from *A* to *B* has been measured by log and is consequently known. The angle *CAB* has been measured by compass computation to be 73 degrees 45 minutes. By trigonometry, therefore, it is a simple matter to find the distance the ship has sailed from the latitude from which she started at *A*, and the distance she has departed from the first longitude. The difference in latitude is represented by *CA* and the difference in longitude, or departure, is represented by *CB*. To simplify the trigonometric calculations, tables of

equator, the longitude reached is found. The direction which the ship has taken will determine whether these differences of latitude and longitude are to be added or subtracted.

In the example here cited we will suppose the ship traversed a distance of 50 miles as measured by log. In Fig. 1, therefore, the distance from *A* to *B* would be 50 miles. By trigonometry or by reference to the proper tables in the epitome, it is found that the difference in latitude, *CA*, is approximately 18 miles, and the departure is approximately 47 miles. This gives a difference in latitude of 18 minutes and a difference in longitude of 47 minutes, as on the equator. But the direction of the ship has been south and east. If the ship had started from a point south of the equator the difference in latitude of 18 minutes would be added to the latitude left. Had the ship started from a point north of the equator this 18 minutes difference of latitude would, naturally, be subtracted from the latitude left. Longitudinal calculations are made east or west of the meridinal of Greenwich. Therefore, had this ship, sailing south and east, started from a point east of Greenwich the difference in longitude of 47 minutes would be added and if starting from a point west of Greenwich it would be subtracted. The results of these calculations will give the latitude and the longitude in which the ship is at the end of the voyage.

A calculation made in this manner is known as figuring position by dead reckoning. This principle of calculation may be carried out for a number of compass directions and various distances on those directions, and the sum total calculated to obtain the general direction of the ship during the whole time, the total distance made good and the new locality. It is first necessary to estimate the true course for each distance, and by trigonometrical calculation or by reference to the traverse tables of the epitome find the difference in latitude and the departure for each. These two estimates are set down in separate columns. The differences in latitude are listed under a north or a south column, and the departures are listed under an east or a west column, according to the direction of the course. All the north latitudes are then added together and the south latitudes added, the larger being subtracted from the smaller and the result given the name of the larger. The same procedure is followed with the departures, the east departures being added together and the west departures added together, the smaller total being subtracted from the larger and the result given the name of the larger. This will give the difference in latitude and the

Table I

## Factors Used in Tabulating a Course

| Course             | Wind         | Lee  | Dev. | Var. | Dist. | New compass                                     | Old compass | Lat.        |       | Dep.       |      |
|--------------------|--------------|------|------|------|-------|---|-------------|-------------|-------|------------|------|
|                    |              |      |      |      |       |   |             | N           | S     | E          | W    |
| S                  | SW           | 1pt. | 5°E  | 10°E | 75    | 183°.45   | 84°W        | ....        | 74.8  | ....       | 5.2  |
| S45°W              | S            | 1pt. | 5°W  | 10°E | 80    | 241°.15   | S61°W       | ....        | 38.8  | ....       | 70.0 |
| S45°E              | ENE          | 1pt. | 5°E  | 10°E | 50    | 161°.15   | S19°E       | ....        | 47.3  | 16.3       | .... |
| E                  | SSE          | 1pt. | 5°E  | 10°E | 10    | 93°.45  | S86°E       | ....        | 0.7   | 10.0       | .... |
| N35°E              | 0            | 0    | 0    | 0    | 24    | 35°   | N35°E       | 19.7        | ....  | 13.8       | .... |
| (Bowditch Table 2) |              |      |      |      |       |   |             |             |       |            |      |
|                    |              |      |      |      |       |   |             | 19.7        | 161.6 | 40.1       | 75.2 |
|                    |              |      |      |      |       |   |             | -19.7       |       | -40.1      |      |
|                    |              |      |      |      |       |   |             | Lat. 141.98 |       | Dep. 35.1W |      |
| Lat. left          | 38° 42' 00"N |      |      |      |       |   |             |             |       |            |      |
| Diff. in lat.      | 2° 21' 54"S  |      |      |      |       | Lat. 141.9 ÷ 60 — 2° 21' 54" Difference in Lat. |             |             |       |            |      |
| Lat. in            | 36° 20' 06"N |      |      |      |       |   |             |             |       |            |      |
|                    | 38° 42' 00"  |      |      |      |       |   |             |             |       |            |      |
| 2                  | 75° 02' 06"  |      |      |      |       |   |             |             |       |            |      |

Lat. 141.9 ÷ 60 = 2° 21' 54" Difference in Lat.

Table II

## Figuring Known Point Into Course

Middle Lat. 37° 31' 03"

| Course | Wind | Lee | Dev. | Var. | Dist. | New compass | Old compass | Lat. |      | Dep. |      |
|--------|------|-----|------|------|-------|-------------|-------------|------|------|------|------|
|        |      |     |      |      |       |             |             | N    | S    | E    | W    |
| SSE    | 0    | 0   | 4°W  | 8°W  | 15    | 145°30      | 834°E       | .... | 12.4 | 8.4  | .... |

an important effect upon the course. The ship may be kept pointed in the same direction all the time but the force of the wind will in time carry her off her course. The wind, therefore, should be taken into account always. Suppose, for instance, on the course noted the wind is blowing with sufficient force to blow the ship one point off her course during the length of the run. If the wind is from a northerly direction, the effect would be to add one point to the compass direction, and if from the south to reduce the compass direction by one point. A point is equal to 11 degrees 15 minutes. Had this wind been from the northeast the result would be to add this point to the 95 degrees, making 106 degrees 15 minutes the true course of the ship in this particular case, or, by the old compass, south 73 degrees 45 minutes east.

By the use of the log the speed of

computation have been provided for the navigator. Any good epitome will serve this purpose, and it is only necessary to refer to such a table. Bowditch tables are usually used by American navigators, and these, having been checked over by government experts and mathematicians and offered for sale at cost by the government, may be accepted as a standard. Applying the known measure of the angle and the known distance sailed the difference of latitude and the departure are taken from such a table. These figures are in nautical miles and it is necessary to reduce them to degrees, minutes and seconds, a mile being equal to one minute.

By applying the difference of latitude to the latitude from which the ship sailed the latitude reached is estimated. Similarly, by applying the departure reduced to degrees to the longitude from which the ship sailed, if sailing on the

departure in nautical miles for a ship which has taken a zigzag course. Reducing the difference in latitude to degrees, minutes and seconds and applying that to the latitude left, the latitude reached is found.

Then we proceed to find the difference in longitude. We must first get the middle latitude. This is obtained by adding the latitude left to the latitude reached and dividing by two. The result gives the mean angle of the general course in degrees which must be figured in connection with the departure in miles as previously estimated. From these two figures are calculated the mean distance the ship has departed from the original longitude. In the traverse tables of the epitome this is accomplished by reversing the use of the table that has been used to figure difference in latitude and departure. The mean latitude is a certain number of degrees, minutes and seconds. This is taken as the accepted angular measure of the course. The departure on this middle latitude is taken as the latitude, the distance given by the table for these two measures being then taken as the departure in miles. For instance, suppose the middle latitude is 37 degrees and the departure 35.1 miles. For 37 degrees and a latitude (here the departure is called latitude) of 35.1 miles the distance is 44 miles. This distance is the difference in longitude, which is reduced to degrees, minutes and seconds. The difference in longitude thus found is then applied to the longitude left, the result being the longitude reached.

Going back to the tabulated calculation of the sailings, we have the difference in latitude in miles and the departure in miles. By trigonometry, knowing the length of two sides of a right-angled triangle it is simple to figure the other angle (the course) and the hypotenuse (the distance from the point left). By referring to the tables in the epitome it is only necessary to find where the difference in latitude and this departure come together in the latitude and the departure columns to find the angle and the distance sailed.

Take the case of a ship which on May 20 was in latitude 38 degrees 42 minutes north and longitude 43 degrees 14 minutes west. The compass showed a variation of 10 degrees east. It happened in this instance that a current set true north 35 degrees east at the rate of one mile per hour for the day. This current must be taken into account as though it were one of the courses upon which the ship sailed. Running one mile per hour for the day would carry the ship 24 miles in the direction of the current. We will suppose a wind with a lee of one point was shifting with each course taken by the ship. The ship

sailed south 75 miles (compass deviation 5 degrees east) while the wind was southwest, then turned and sailed 80 miles south 45 degrees west (compass deviation 5 degrees west) while the wind shifted to south. Next the ship sailed 50 miles south 45 degrees east (compass deviation 5 degrees east) when the wind was east northeast, and then sailed 10 miles east (compass deviation 5 degrees east) while the wind shifted south southeast. We would tabulate this course as shown in Table I.

The middle latitude gives an angle of 37 degrees whereas the departure here is 35.1 miles west. In the table in the epitome (Bowditch, Table 2) which gives the difference of latitude and departure

tance that was made good 146 miles.

It may be more convenient for a navigator to take his departure from some point the latitude and longitude of which is known, such as a point of land or a light vessel. In this case the distance from the known point to the ship and the direction must be set down in the table of courses and figured into the total distance traversed. For instance, suppose the ship is laying 15 miles north northwest of Sandy Hook light vessel. Then this distance, when figured into the course would be south southeast. If the direction of the light vessel is taken by the compass and the compass has a variation and a deviation which is known then these factors must also be taken

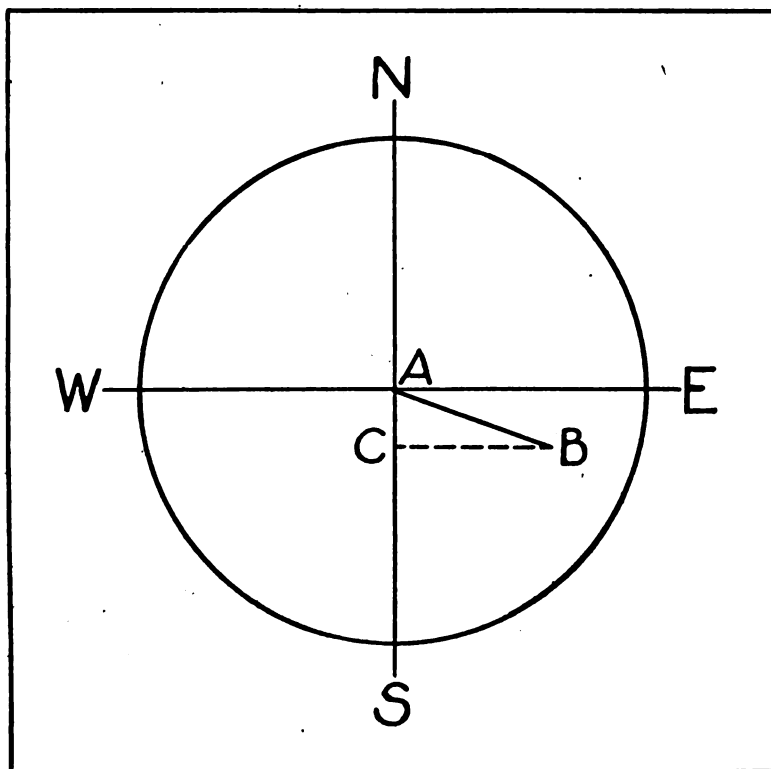


FIG. 1—CALCULATING A COURSE BY DEAD RECKONING

for 37 degrees, we find that for a latitude of 35.1 we get a distance of 44 miles, which reduced in terms of degrees by dividing by 60 gives 44 minutes. This 44 minutes is the difference in longitude.

|              |               |
|--------------|---------------|
| Long. left   | 43° 14' 00" W |
| Diff. in Lo. | 44' 00" W     |
| Long. in     | 43° 58' 00" W |

For a course which has a difference of latitude of 141.9 and a departure of 35.1, the table in the epitome (Bowditch, Table 2) gives the nearest measurements of Lat. 141.7, Dep. 35.3, which is near enough for the purpose of dead reckoning. For these measurements the table gives 14 degrees as the angle of the course and 146 miles as the distance made good. The answer, therefore, is course south 14 degrees west, and dis-

into account. In this instance the distance from the light vessel would be figured in as shown in Table II.

A proper knowledge of dead reckoning is not to be held in any slight esteem by navigators. The popular conception is that merchant ships place their entire dependence upon such a method of reckoning, but it is not infrequently the case that even our astute naval officers are forced to depend upon it. Several days may pass at sea without a heavenly body showing itself and when an observation is impossible. At such times absolute dependence is placed in dead reckoning. For all practical purposes calculations sufficiently accurate can be made in this manner, although it is true that the greatest degree of efficiency is had by observation.

(To be continued)



# New Capital Enters Ship Field

American Interests Endeavor to Join Up Shipbuilding With Ship Operation—Significant Change is Strengthening Merchant Marine

**E**NGLISH shipping gained its supremacy by virtue of the close co-operation between the steamship owner, the banker and the merchant who shipped. The English shipping corporation supplanted the type of shipping organization practiced by Americans with better and more efficient methods of conducting business just as effectively as the English iron ships driven by steam supplanted the American clippers. Significance attaches, therefore, to the change in American steamship organization since the war with Germany, as a development holding many possibilities for the future.

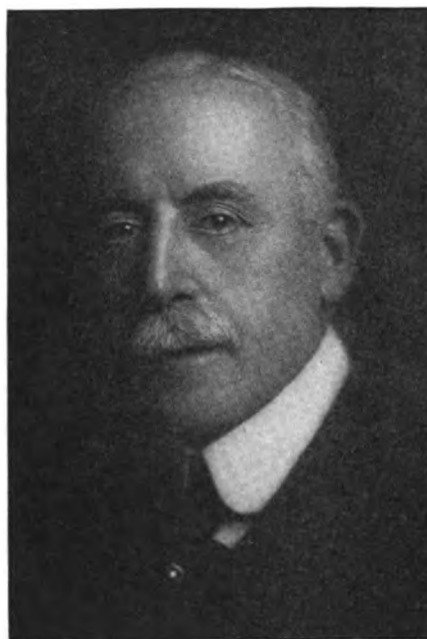
The growth of American foreign trade in the latter part of the eighteenth century was marked with the rise and passing of the great merchant trader, such as Stephen Girard, Philadelphia, and Elias Hasket Derby, Salem, Mass. These men were more than steamship owners. They furnished the freight for their ships, sold this freight in foreign markets and purchased return cargoes for their boats which they in turn disposed of through their mercantile establishments in the United States. But ocean commerce grew to such importance that the business of ocean transportation became a highly developed industry, separating itself from individual ownership. It was at that time the English showed their ingenuity and blazed the way.

Outstanding examples of private shipowners and ship operators under the American flag are still extant in such figures as Edward Luckenbach and Robert Dollar. Such men have successfully withstood the vicissitudes of competition and hostile legislation as strong men are so apt to do. For the most part, however, American shipping men prior to the German war were apparently convinced that only in combination could ocean shipping be carried on successfully. The so-called trust method of conducting a business was finding its way into the shipping industry, with the powerful New York banker, Commodore J. P. Morgan as leader.

## World's Largest Lines

The movement toward consolidation of steamship lines became pronounced after 1850. At the outbreak of the German war, ocean transportation was largely in the hands of such com-

panies as the Hamburg-American line; North German Lloyd; British India Steam Navigation Co., Ltd., Furness, Withy & Co., Ltd.; Elder, Dempster & Co., Ltd.; Ellerman line; Nippon Yusen Kaisha; Cie. Generale Transatlantique; Peninsular & Orient Steam Navigation Co., Ltd.; "Hansa"; Deutsche; Holt & Co.; Hamburg-South American; Messageries Maritimes; Royal Mail Steam Packet Co.; Union Castle Mail Steamship Co., Ltd.; Leyland & Co., Ltd.; White



JAMES A. FARRELL

Star line, and the Cunard Steamship Co., Ltd.

The largest of the American steamship combinations was the International Mercantile Marine Co., created by Mr. Morgan. This is an American line, although the bulk of the tonnage controlled flies a foreign flag. Mr. Morgan organized this firm in 1902 with the original idea of creating a combination which would control the dominating fleets operated under all maritime flags. He was successful in including in the organization five transatlantic lines which had a combined fleet of 136 vessels, the lines being the Leyland, White Star, Red Star, Atlantic Transport and the Dominion. It was Mr. Morgan's original idea to include the Cunard and the Hamburg-American lines in the merger, but the British government largely increased its sub-

sidy to the Cunard in order to persuade it to remain out, and the Hamburg-American and the North German Lloyd were under contract not to sell out to a foreign company. Overcapitalization in 1902, when the combination was organized, was alleged to have been the root of the trouble encountered by the International Mercantile Marine in 1915 when a receiver was appointed. But the war demand for shipping soon became so pronounced that the company was rapidly restored to a sound basis.

In 1915, the movement to consolidate received a considerable impetus by the organization of the American International Corp. This organization is reputed to have had its incipency in the fertile mind of Frank Vanderlip, then of the National City bank, New York. The corporation created a community of interest among a number of diversified companies all of which have a more or less common interest, that is, the extension of the foreign trade of the United States. The National City bank was among the first to establish foreign branches when permission to do so was granted under the federal reserve law and its interest in the American International Corp. was, therefore, readily apparent. The corporation acquired an interest in the International Mercantile Marine and the United Fruit Co. It is, moreover, associated with the international merchants, W. R. Grace & Co., which, in 1916, acquired control of the Pacific Mail Steamship Co. The American International Corp., the International Mercantile Marine Co., the Pacific Mail Steamship Co. and W. R. Grace & Co. acquired the controlling interest in the New York Shipbuilding Co., Camden, N. J., in November, 1916.

## Develop New Relation

This latter development was probably the first time that an active interest was created between an American steamship company and an American shipbuilder. Such associations in England have long been common, and it is an arrangement that has grown more common in the United States since the war with Germany. W. R. Grace & Co. were represented on the directorate of the American International Corp. until recently. The actual combination of interests under the banner of the American Inter-

national Corp. is difficult to trace in detail although there is no denying that the community of interest is there. At present, the outstanding figure in the combination is George J. Baldwin. Mr. Baldwin is the senior vice president of the corporation and serves as president of the Pacific Mail and chairman of the board of the New York Shipbuilding Co.

The important engineering firm of Stone & Webster also became associated, these partners being active in the direction of the American International. Mr. Stone is also a director of the International Mercantile Marine Co. Although an actual interlocking of directorates between W. R. Grace & Co. and the corporation may be lacking, the community of interest is there as attested to by the various investments of the companies in question. W. R. Grace & Co. not only do an extensive import and export business, owning mercantile houses in most commercial centers of the world, but the company owns and operates the Grace line of steamships.

#### War Brings New Ideas

The International Mercantile Marine Co. has but followed the new trend in American shipping circles, namely, the combination of an American shipbuilding company with an operating line. Since the war with Germany, the new movement has been distinctly in evidence in the corporate ownership of the American marine industry.

The greater development prior to the war was the so-called industrial line, which was, in substance, a fleet of ships operated by some commercial company to insure transportation facilities for its own product. The Union Sulphur Co., the United Fruit Co., and the Standard Oil Co., were typical examples. These companies all own and operate fleets especially designed for the transportation of the products in which they are interested. The industrial line has by no means outgrown its usefulness. The ore carriers of the Great Lakes are largely industrial lines, closely allied to the steel companies for which they transport iron ore. The Cuba Distilling Co. has a fleet of ships which are used to transport molasses. This industrial line has four boats under the American flag, varying in size from 4746 to 5788 gross tons. The boats of the Union Sulphur Co., numbering five under the American flag, vary in size from 2783 to 5746 gross tons. These are all modern vessels embodying efficient equipment.

Now it develops that the American Sugar Refining Co. has at last decid-

ed to build up a fleet of its own. This company has purchased a boat and has contracted with some American yards to have a number of molasses tankers built. To balance things, the big coastwise merger has entered the industrial field. The Atlantic, Gulf & West Indies lines invested heavily in Mexican oil properties last year and have since let for a fleet of tankers. The purchase contracts with a number of builders of the oil lands was not with the sole intention of guaranteeing this line a supply of bunker oil, but the company plans to engage in the sale and distribution of petroleum and its products and for this purpose it will build up an industrial line of its own. Some of the larger tanker contracts



IRVING T. BUSH

let with Atlantic coast yards during the past few months were for account of this shipping combination.

The new development in maritime corporations, however, was first found in the activities of the Bethlehem Steel Corp. and the United States Steel Corp. The Bethlehem corporation purchased a number of shipyards before the outbreak of the war and entered actively into shipbuilding. The corporation now owns yards at Wilmington, Del.; Sparrows Point, Md.; Quincy, Mass.; Elizabeth, N. J.; and San Francisco. The corporation also owns the Ore Steamship Co., which is an industrial line of bulk carriers designed to bring iron ore from Cuba and Chile to Baltimore. The Ore line, it is reported, is now designing some especially large bulk carriers which will transport oil down the west coast of South America and

bring iron ore back from Chile. As yet the Bethlehem organization has not indicated any decided attempt to go into the business of ocean transportation except for its own account.

The United States Steel Corp. has gone much further and its holdings are by no means limited merely to mines and mills. The corporation has extensive holdings in rail lines serving the ore ranges, possesses the largest fleet of bulk carriers on the Great Lakes and has extensive marine equipment on the Monongahela and Ohio rivers. According to the latest report of the Steel corporation, its subsidiary, the Pittsburgh Steamship Co., owned 78 steamers, 21 steel barges, two fire tugs and two scows on the lakes. The corporation's equipment on the Monongahela and Ohio rivers consists of seven steamers, 167 steel barges, 13 wood barges, five tugboats, two keg boats and four scows. Additional marine equipment is being built. Through the United States Steel Products Co., the Steel corporation has long been interested in ocean shipping. The Products company owns seven steamers varying in size from 4229 to 5773 gross tons. By maintaining a close relationship with the steamship agency of Norton, Lilly & Co., the Products company has been able to employ its ships effectively in the general business of ocean transportation.

#### New Interest in Shipbuilding

But with the outbreak of the war, the United States Steel Corp. became interested in shipbuilding, following closely the example set by the Bethlehem corporation acting under the able direction of Charles M. Schwab. The Steel corporation built a yard at Chickasaw, Ala., and another at Kearny, N. J. The Chickasaw shipyard has eight ways, fitting out docks and shops, making it a complete shipbuilding plant. The Federal Shipbuilding Co., at Kearny, has 12 ways, fitting out basin, docks and shops. Already these plants have taken contracts to build new freighters to be added to the fleet owned by the Products Co.

Immediately after the armistice, the Products company chartered a number of the vessels of the American-Hawaiian line for operation in the South American trade. The Steel corporation is evidently greatly interested in the South American as well as the coastwise trade between the Atlantic and the Pacific as it intends to revive some services which the war discontinued. The Isthmian line has been established, which is to operate between the east and west coasts of the United States through the

Panama canal. This line has already let contracts for building a number of new vessels, these contracts, of course, going to the Steel corporation's yards. The Products company also owns the New York & South America line which will send some steamers through the Panama canal to ports in Peru and Chile and other ports along the western coast of South America.

The corporate relationship between the Ore line and the Bethlehem Shipbuilding Corp., and between the Isthmian and other lines owned by the Products company and the Federal and Chicasaw shipyards are typical of the new relationship which is growing up in American maritime circles. This form of development is not unusual in Europe, but a community of interest between any particular shipyard and a steamship line was a rarity in the United States until the American International group acquired the plant of the New York Shipbuilding Corp.

American shipping companies, especially those engaged in overseas trade, did not become interested in American shipbuilding prior to the war with Germany for the simple fact that there was no call for such an association. Ships operating in the overseas trade must compete with foreign ships and one of the great factors in ocean shipping is capital investment. To make competition successful, the ships under the American flag must cost no more to build than its costs to build foreign ships. The war necessity threw shipbuilding costs out of gear. For four years it was not a question so much of what a ship cost to build as it was to have a ship. Those lines which had tonnage to operate reaped a rich harvest, and it was readily shown that a line which had a close connection with a shipyard was the line which would have the best opportunity of getting a new ship built. The expansion of shipbuilding properties in this country was tremendous and it was only natural that some of this money for expansion should come from shipowners.

#### New Money for Yards

In Brooklyn, N. Y., Irving T. Bush had constructed an extensive and modern shipping terminal. It was believed that Mr. Bush was interested only in terminal properties, but it now develops that he, like many others, have seen fit to invest in shipbuilding properties. According to the report which is circulated without refutation so far, Mr. Bush owns one-third interest in the Newburgh Shipyards, Inc. But Mr. Bush's private activities in this direction are but typical

of the trend of investments of other moneyed men of business. One small group of marine insurance men, exporters and importers and others organized an investment trust and in the open market began to buy into several steamship lines and shipbuilding yards. This trust was organized for the sole purpose of earning money on its investment and its prime consideration was to distribute its funds so that its income would be fairly regular. Important investors have followed similar tactics and when the final score is taken, the public will undoubtedly be surprised to discover that a community of interest between businesses related to the maritime industry have built up of their own



W. AVERILL HARRIMAN

volition an interlocking relationship which should result in a permanent betterment.

At the present moment, many of these investment activities are hidden. The men of money who risk their funds are actuated to do so only by their confidence in the industrial undertaking for which such investments afford capital. They know only too well the political complexion in Washington and the ease with which a radical may move the government to agree to a maritime policy. These persons do not wish to have their activities given undue publicity because such may only incite hostile activities in legislative circles just at a time when cooler wisdom should prevail.

"We have nothing to hide," said one such investor. "We are perfectly willing to tell you what the situation is, and how far we have tied up one property with the other, because we

are confident we are on the right road and have nothing to conceal from a reasonable thinker. But we do not wish any publicity. We have no desire to invite lightning."

In 1918, the Kerr line came into prominence. This company grew to large proportions and acquired a financial backing which was considered phenomenal. Many American officials of former powerful German lines took posts with the Kerr line, and it was claimed that the Kerr ships would have the entre to Germany after the war blockade was lifted. The spectacular growth of this line gave rise to all sorts of rumors, notable among which was that it had the financial backing of the old Hamburgh-American Steamship Co. The alien property custodian, however, never discovered any such thing and although the Kerr line was vindicated in the eyes of the public, it has not yet become a member of the American Steamship Owners' association, despite its ownership of a vast fleet of ships under the American flag. Behind the Kerr properties is A. E. Clegg, a rather young steamship genius of English parentage and training.

#### Acquires Cramp Holdings

Under the guidance of a prominent private banking house the Kerr interests began buying into the shipbuilding firm of Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia. This is the yard which has the distinction of building the most noted of the passenger steamers operated under the American flag. The Kerr line and the control of the shipbuilding company were thrown into a new firm known as the American Ship & Commerce Corp. and the bankers began an active campaign to float the securities of this new organization. Gen. George W. Goethals, of Panama canal and shipping board fame, was prevailed upon to accept the presidency of the holding company and Kermit Roosevelt was made secretary. Through this holding company, an aggressive steamship line was definitely tied up with one of the oldest and most powerful shipbuilding companies in the United States.

The prime movers in steamship corporate activities of the present day have all been of one mind, that the solidity of their undertaking depends upon a combination between the steamship line and the shipbuilder. The most spectacular figure in this new trend is undoubtedly W. Averill Harriman, the son of the Harriman of railway fame. Mr. Harriman is not far past 30 years of age and already he is beginning to show the genius



that marked his father. But where the elder Harriman dealt in railways, the son shows a propensity for ocean transportation. When the shipbuilding boom was at its height, young Harriman acquired the Chester yard of the Merchant Shipbuilding Corp. This was in May, 1917. At the instance of the shipping board, the Merchant corporation built the Harriman, Pa., yard and operated it as an agency plant for the government.

Following the armistice, Mr. Harriman organized the Independent Steamship Co., and then purchased the Shawmut and the Coastwise lines. The Shawmut has three boats, varying from 5075 to 6214 gross tons, and the Coastwise has nine ships under the American flag, ranging in size from 3521 to 5266 gross tons. The Harriman interests thereupon incorporated the Livermore, Deaborn Co., Inc., which is chiefly an operating company. The vessels of the lines bought up were turned over to this new company, under the English system for operation on a percentage basis. In this instance, it will be observed, the steamship line or lines did not purchase the shipbuilding yard, but the shipbuilding yard purchased the steamship lines.

Not content with his acquisition of this property, Mr. Harriman started in to secure an interest in the noted American-Hawaiian line. This line possessed a contract to transport Hawaiian sugar to the United States prior to the war. The war diverted

all the boats to the Atlantic trade and the United States government commandeered them. The American-Hawaiian by careful management has built itself up to an enviable position and has written off a great percentage of the original cost of its fleet. Following the armistice and the relinquishment of the fleet from government control, the line chartered its boats in the South American trade, and Hawaiian sugar has found another carrier for the time being. In the fleet are 16 ships, varying in size from 5648 to 8723 gross tons. After Mr. Harriman began buying into the American-Hawaiian line and was elected one of the directors, it was announced that the Merchant Shipbuilding Corp. would build for this company two diesel-engined ships of 11,000 tons deadweight. It is understood that the diesel-engined boats are intended for the transpacific trade. The Harriman boats, it is expected, will operate to the Dutch East Indies and the Levant.

Soon after Mr. Harriman became interested in the American-Hawaiian line he sold to this line the Coastwise steamship fleet. While the nature of this sale was not disclosed, it is reasonable to expect that it only strengthened his control of the older overseas company.

But Mr. Harriman did not rest content with combining steamship lines with shipbuilding properties. In addition, he established the private

banking house of W. A. Harriman & Co., Inc., with the idea of specializing in marine securities. Lester H. Monks, of the marine insurance firm of Monks, Goodwin & Shaw, was elected president of W. A. Harriman & Co., Inc. It is evident that the activities of Mr. Harriman have not yet ended. His business is growing and from what he has already done it is clearly his intention to co-ordinate a group of maritime undertakings that he may insure the success of each.

These constitute but the bolder efforts on the part of private shipping interests to establish the American maritime business upon a solid basis. If the government will only lend them sufficient encouragement by legislation which may be accepted as a clear pronouncement of its policy of noninterference, many other co-ordinating investments will soon make their appearance in the market. The Consolidated Steel Corp., the export combination formed under the Webb-Pomerene law, has been anxious to obtain a steamship line, but its efforts to fulfill that ambition are reported to have been frustrated rather than encouraged by the shipping board. Other export combines would undoubtedly desire to do likewise. If the American merchant marine is to be built up under a system of private ownership and management, industrial lines and the "community of interests" lines should be encouraged.

## Find Use for Wooden War-Built Ships

BY R. C. HILL

**T**HE first Ferris-type wooden vessel, designed as a steamship and made into a sailer, has just completed her maiden trip. She is the 5-mast barkentine ALICIA HAVISIDE. From all reports the vessel met the expectations of her new owners and confidence has been gained by other operators who are planning to purchase government wooden hulls to operate under sail.

The ALICIA HAVISIDE is the first of five Ferris hulls purchased by the Pacific Freighters Co. to go into commission. Her first voyage was in ballast from San Francisco to Vancouver, B. C., where she loaded lumber for Durban, South Africa. While she made no record on this run, she was severely handicapped by lack of favorable winds, having to beat almost the entire distance but negotiated an average passage. Shipping board officials point to this record as proving that these hulls, although originally designed as steamers, can be

used to advantage when rigged as sailers.

"Interest in the performance of the ALICIA HAVISIDE has been widespread along the north Pacific," said C. O. Yoakum, general manager of the supply and sales division of the Emergency Fleet corporation, "because other operators are figuring on purchasing hulls of this design. Some think the most desirable rig is a barkentine, while other equally experienced owners and operators feel that to convert the hulls into schooners will prove as advantageous. All agree, however, that they will prove successes as sailers and first proof is the trial of the HAVISIDE.

The ALICIA HAVISIDE towed out of San Francisco bay Feb. 12 and March 5 was off Cape Flattery. During the interim she experienced a scant percentage of favorable weather, being beset by adverse winds and calms. Her log shows that 11 days after getting a departure from San Francisco bay she

was 500 miles to the westward and only 15 miles to the north of the bay, her position being 38 north, 134 west. The fifteenth day she was in 41 north, 132 west, or about abreast of Humboldt bay. Favored at times during the latter days of her voyage, she gave fair indication of her speed, in one two-hour stretch reeling off 20 knots and on two occasions she logged 37 knots in one watch of four hours. All of the time when showing such speed she was under small sails.

"As to sailing and handling qualities she is an entire success," is the report of Capt. L. C. Hansen, a veteran who has been in sailing ships in the north Pacific for years. "The HAVISIDE will come about without missing stays any time she can carry a spanker," added Captain Hansen. Sailormen agree that a more comprehensive tribute could not be paid a new ship of the class. Even figuring that it was actually 23 days the



HAVISIDE was on the way, she not having been picked up by a tug off Cape Flattery until March 6, a day after she sighted the cape and stood in, the same time was made by the schooner GEORGE E. BILLINGS, built in 1903, which entered Puget sound Feb. 25 from the Golden Gate and proceeded to Port Blakeley to load for Sydney.

The HAVISIDE is under engagement to load lumber at Vancouver, B. C., for Delagoa bay, South Africa, at \$52.50 a thousand feet. Captain Hansen estimates conservatively that the ship will work full 2,000,000 feet on a 9-foot deck-load. She got away from San Francisco with less than 500 tons of ballast and he has arranged to load sufficient to give her a total of 600 tons.

She is rigged as a 5-mast barkentine and is the first 5-master of the rig seen among Pacific windjammers. In general the rig of the Haviside is akin to others of the 4-mast barkentine type. She has a "spike" boom instead of the flying jibboom of former days, and she does not boast a martingale. She has the customary number of sails and yards, but the latter probably have more reach than most barkentines. The booms on the other sticks, the four carrying the fore and aft rig, are each 40 feet in length. While equipped with a donkey engine forward, the HAVISIDE also has a 10-horsepower gasoline pump, located in a deck-house amidships. This is the only house between the fore-castle and poop. The gasoline engine is used in handling sheets, halyards, braces, etc., while at sea. Also it has connections to operate a centrifugal pump. She has four hatches, the two in the waist being the largest and providing adequate space for stowing lumber, while with coal or similar deadweight cargoes, the smaller hatches fore and aft can be worked expeditiously in handling cargo. She carries 18 men.

## American Firm Allied with Hadfield

The American Clay Machinery Co., Bucyrus, O., and Sir Robert Hadfield, world famous steel manufacturer and scientist, Sheffield, England, have become associated in the organization of a new company. This firm will be known as the Hadfield-Penfield Steel Co. with general offices and works at Bucyrus, O. The Hadfield interest in the new company is heavy, the American Clay Machinery Co. retaining the majority interest.

The American company has been manufacturing a line of auxiliary deck equipment, started during the war but now forming a permanent division of the company's activities. This department will be maintained as well as the manufacture of fuel oil engines, steel castings, industrial locomotives, steam shovels, cement making and clay working machinery, bakery and flour mill machinery in addition to the new line of steel manufacturers introduced by the Hadfield interests.

R. C. Penfield, president of the American company, in seeking the rights and patents of Hadfield's, Ltd., found Sir Robert Hadfield desirous of extending his business in America. The Hadfield company is one of the largest steel manufacturers in England and Sir Robert Hadfield has an international reputation as a manufacturer and scientist. His development of the manganese steel making process led to his being knighted.

The American company, reinforced by the experience and strength of the Hadfield organization, plans to expand its activities and to develop new products, particularly in ship deck equipment. H. D. Van Doorn, manager of this department of the American company, will continue in the same capacity with the new company with offices at Philadelphia.

Ole Hanson, former mayor of Seattle, has written an interesting book on "Americanism versus Bolshevism" in which he describes the successful efforts put forth at Seattle to curb "red" activities. The influences at work among shipyard workers are clearly traced. The reds were strongly entrenched at Seattle and Mr. Hanson's firm stand for law and order, taken at the opportune time, did much to check any chance of the evil spreading in this country. The book is well written in clear forceful language. Mr. Hanson understands his subject thoroughly and he has written a book that is an exhortation and a warning to the liberty loving American public. Furthermore, it is a convincing statement of democracy in terms of American deals. *Doubleday, Page & Co., New York.*



FERRIS TYPE WOOD HULL RIGGED AS A 5-MAST BARKENTINE



# Outline Policy in New Senate Bill

Senator Jones Unites Various Suggestions for Shipping Policy  
Into One Measure—Action Promised at This Session of Congress

**S**HIPPING legislation, such as now suggested to the senate committee on commerce by Senator Jones, chairman of that committee, has practical as well as a political significance. In the measure which the senate committee is now considering are virtually all the plans advanced by witnesses before that committee for the purpose of building up an American merchant marine. The enactment of the measure would neither guarantee an immediate return to private ownership nor the permanent extension of government ownership, but leaves in the hands of the shipping board authority to work out the solution of this difficult problem. Probably the most significant thing about the bill is the fact that under it, the shipping board would have the power to promulgate regulations which would in fact have the authority of legislation wherever such regulations do not conflict with laws already on the statute books.

Government ownership would be continued until the shipping board could dispose of the fleet to the best advantage and under conditions which would seemingly insure their continued operation under the American flag. Various means are provided for the assistance of private operators and owners. For instance a form of mail subsidy is provided and the shipping companies would be relieved in a measure from the payment of taxes. Commercial treaties would be abrogated and American ships allowed a discriminating duty under the tariff act.

## Includes Previous Bills

In preparing his bill, Senator Jones included the Greene bill, passed by the house of representatives last November, which he has amended somewhat; portions of the latest draft of the ship mortgage bill; the marine insurance bill pending in the house; the Ransdell bill and his own two bills. While a number of the suggestions made to the committee by ex-Chairman Payne of the shipping board have been incorporated in the bill, Senator Jones has gone contrary to the ideas of Judge Payne in at least one respect, that is, the personnel of the shipping board. Judge Payne objected to making the membership more than five and thought that even a smaller num-

ber would be advantageous. Senator Jones has provided for the creation of a new board to be composed of seven commissioners, two from the states touching on the Pacific, two from the states touching the Atlantic, one from the gulf district, one from the Great Lakes district, and one from the interior. Not more than four of the commissioners shall be appointed from the same political party. Each member of the board shall receive a salary of \$12,000 per annum, except the chairman who shall receive \$12,500 per annum. The President is authorized to designate the member to act as chairman.

## Leaves Seamen's Act Alone

The new bill makes section 4530 of the revised statutes apply to seamen on foreign vessels while in harbors of the United States, and opens the courts of the United States to such seamen for its enforcement. This is the section of the LaFollette act that refers to the pay of seamen. It also restates with amendments, section 13 of the LaFollette act under which an American may qualify as an able seaman after one year service.

The Washington representative of THE MARINE REVIEW finds a sincere belief on the part of political leaders that the shipping legislation will be put through congress at the current session. This belief is shared by the officials of the shipping board who are apparently giving their moral support to the legislation as it is being constituted. Senator Jones was extremely frank in discussing the measure. He epitomized the important features of the suggested legislation as follows:

"My suggested amendments, if agreed to, would, among other things do the following:

"Declare the need for a merchant marine large enough to carry the major part of our foreign commerce as a means of national defense as well as commercial growth and that it will be our policy to do what may be needed to maintain it.

"Such a marine is to be owned and operated ultimately by private parties and capital. In the sale of ships the board is given the widest discretion to use good judgment and use its discretion to aid in building up an adequate merchant marine.

"The board is directed to describe

what routes and lines shall be established and it is authorized to establish and maintain these to promote our commerce and carry our mails if private parties will not do it.

"A fund is created which the board can use to construct or aid in constructing up-to-date, mostly highly equipped and suitable and economical ships needed in our contest for the world's trade.

"A new shipping board is created of seven members to be taken from the different sections of the country. A salary is given that will attract and hold strong, able men. This ought to bring about a fixed, wise and able administrative policy and helpful recommendations to congress for future legislation.

"The law against transfers of our ships to aliens without the consent of the board is made clear and certain.

## Gives Board Free Hand

"The board is given the power to make and change at will rules affecting shipping and to meet conditions and methods of trade of our competitors and it is given full control over all rules, except health rules, affecting our shipping. This will help us to meet orders in council and other things that have heretofore kept our shipping down. It will also make uniform the rules to govern shipping. Also the body charged especially with aiding our merchant marine will have the power to see that rules are made that will aid in the great purpose that we have.

"The seamen's act is amended to carry out the original intent and it is made clear that it affects in certain respects foreign ships and sailors as well as our own. It also makes it possible for American citizens to have the rating of able seamen after one year's service at sea to the extent of one-fourth of the crew. This ought to help to get the American on the sea.

"The board may provide for apprentices upon ships of the board or ships having contracts for carrying our mails. The board and the postmaster general can fix the price to be paid for carrying United States mails and these mails must be carried on American ships when this can be done.

"Our coastwise laws are extended, after six months, to the Virgin, Sand-



wich and Philippine islands and the board is directed to see that these islands have adequate service. This will do much toward the construction and operation of fine ships in the Pacific and do much for our trade in that great theater of the world's commerce.

"The board is directed to see that ample ship service is had from the terminal of the Alaska railroad. This is highly important.

"Marine insurance associations are taken out from under the Sherman antitrust act to encourage American marine insurance which is now largely in British hands.

"A carefully drawn mortgage provision is presented. This is necessary if American capital is to become interested in shipping. This will do much to get our ships in private hands and have our people become interested in shipping securities.

"The great terminals acquired at many of our ports during the war are placed under the control of the board to be used by it in aid of our shipping. This ought to be of great service.

"I want the shipping board to become a great agency to aid our merchant marine. The board of trade in England is the greatest single force and aid to British shipping. Our shipping board should be as nearly as may be to our shipping what the British board of trade is to British shipping. Our shipping board should do all it can to aid our merchant marine. That should be its highest aim and purpose.

"I have tried to set forth a national aim and purpose in these amendments. Timid, hesitating action will do nothing in this contest. We must be active, aggressive and determined in seeking our own interests. If we do not look after our own interests from all points of view no one else will."

In framing shipping legislation, congress is bombarded with views and counterviews, charges and countercharges. Much of the testimony collected by such a method is, of necessity, widely at variance in many vital points. In the present instance, congress has been compelled to listen to a 4-cornered fight. On the one side was the American shipowner, and on the other was the American shipbuilder. The other two interested parties were the shipping board and the growing list of American steamship charterers and operators. These different interests were not agreed upon any broad policy by which the general goal could be accomplished, namely the upbuilding of the American merchant marine. Such suggestions made by the various factions which Senator Jones concluded would bring about the end desired were consequently thrown together to make up the bill. The Democratic suggestion of discriminating duties was combined with the Republican policy of mail subsidy; the shipbuilders' plea not to sacrifice the fleet was kept in mind together with the request of shipowners that they be permitted to buy the government's vessels.

#### Cannot Satisfy Everybody

To the average member of congress, the shipping problem is today much like the currency system of the country following the Civil war. At that time various forms of currencies and a big national debt made up a national problem. The whole was thrown into the legislative basket and the national bank act was evolved. That law failed to satisfy everyone but it was a mighty instrument for bringing order out of chaos. Today, the country has various private shipping enterprises and a big national merchant fleet. It might be said of Senator Jones that he has thrown the

whole into the legislative basket and proposes to draw out the measure he has suggested to his committee. The Jones bill, may not please everyone, but nearly everyone will find provisions in it to his liking. The bill leaves many desirable things unattended to and even the legislators at Washington are not certain that it will relieve congress of the duty of enacting further shipping laws at future sessions. The Jones bill has been designed to relieve the shipping industry of the uncertainty it has been laboring under ever since the world war. It is a basis upon which a beginning can be had. Its sponsors hope at least that it will prove a conclusive pronouncement of Washington to do all it can to revive the business of ocean shipping under the American flag, and if that is achieved, the confidence of the voting public can be assured.

The shipowners' suggestion that the government vessels be sold at approximately \$100 a deadweight ton still has advocates in congress, but apparently the majority are not convinced that such a price will dispose of any great portion of the fleet and that it would make permanent shipping under the American flag. The present chairman of the shipping board, Admiral Benson, is mindful of the fact that the original shipping act was placed upon the statute books as a national defense measure and members of congress recall the fact that they have been committed to an American merchant marine because such is a natural and necessary auxiliary to a strong navy. The merchant marine problem is still tied up to the problem of evolving peace and the maintenance of peace, and that fact must be kept in mind by those who analyze the position of congress upon a definite national shipping policy.

## Late News from Foreign Shores

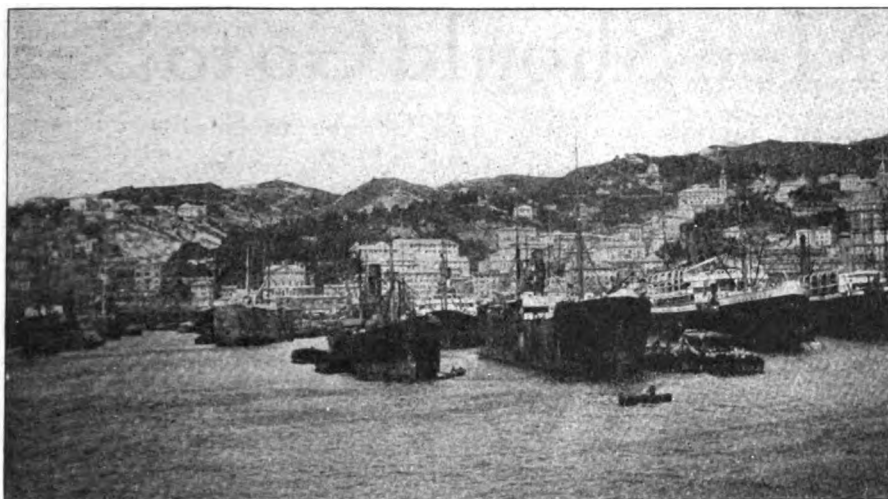
BY THE PARIS REPRESENTATIVE OF THE MARINE REVIEW

WITH the decision to import petrol products to make up for coal deficiencies, the French ports commission is occupying itself with the question of receiving facilities for mazout and other heavy oils and distillates. Marseilles, Rouen and Bordeaux are classed by themselves as being in a position to meet any exigencies which may develop. The minor ports where facilities are to be enlarged include Boulogne where important installations are being carried out and Cherbourg, where there are already two im-

portant reservoirs and floating equipment for the bunkering of oil burning vessels. At Brest, the installations to date are only those of the French navy, which though considerable are not deemed sufficient for merchant ships which may use Brest as a port of call.

At Le Havre, the most elaborate installations are to be carried out. One American controlled organization alone proposes to land 2,000,000 tons of liquid combustible there in a year. Pipe lines are being laid to Paris, one of 12-inch diameter for mazout, or heavy oils, the

other of 6-inch diameter for lamp oil. Each will have six pumping stations on the route which will be approximately 150 miles. The layman in France marvels that such a thing could be, ignoring entirely the great lengths of pipe lines in the United States already in operation. Nantes has an installation which will care for 300,000 tons at the present time, but which will be extended to 1,000,000-ton capacity before the end of 1920 if present plans are carried out. Cette, on the Mediterranean, has already large facilities which can readily be ex-



HARBOR OF GENOA, THE NEW TRANSIT PORT OF SWITZERLAND, FROM A PHOTOGRAPH BY THE AUTHOR

tended to care for the mazouts which will be needed in great quantities in that region when the Paris, Lyons & Mediterranean and the Midi railways complete their transformation to oil burning locomotives.

Coupled with the reservoir accommodations on shore is the question of floating equipment, of which but a small capacity is actually constructed. It is foreseen that a great demand will develop for this type of craft which as yet has hardly been thought of, still less designed and laid down in series as it should be at once.

\* \* \*

## To Supply Steel

The parent steamship line of France, the famous Messageries-Maritimes, recently completed a tacit arrangement with a large combination of iron and steel interests in mid-France to supply the Messagerie shipyards at La Ciotat on the Mediterranean with the iron and steel necessary for its ship and engine building needs. The firm in question is said to have plants on the Gironde river below Bordeaux, in the center of France and in the department of the Orne on the English channel. This points to the famous Creusot plant and its associated organizations. It may mark the entry of this powerful firm into the shipping business. If so, the combination will be one of the most formidable and best equipped business units of continental Europe.

\* \* \*

## Genoa, a Swiss Port

The consortium of the port of Genoa has signed an agreement with Berne, Zurich and Basle in the mountain republic of Switzerland whereby Genoa becomes the principal transit port of Swiss overseas trade. This seriously affects the ports of Hamburg, Rotterdam and Antwerp, which carried the bulk of the traffic before the war and the French

Mediterranean port of Cette, which during the war was practically put at the disposition of Switzerland for her needs during the period when the allies had control of the seas. To a lesser extent, it affects also Marseilles, and will do so still more when the Rhone is made navigable, as is proposed, to Lyons and Geneva.

Of coal alone there is arriving at Genoa 40,000 tons per month in transit for Switzerland on which the Italian port authorities turn a neat profit of \$16,000 per month for dues. Besides there is the traffic in cotton, sulphur, wool, phosphates and cereals which in transit fees bulk even larger. This is the first manifestation of Italian economic politics in relation with international affairs and is entirely creditable to Italian astuteness.

\* \* \*

## French Steam Colliers

The French Paris, Lyons & Mediterranean railway has taken delivery from Sunderland, England, of its first steam collier, the GAP. It is the first of a series of 18 coal boats for this company's traffic. The ships are to be uniform, 298 feet in length, 40.6 feet beam, with a cargo carrying capacity of 5000 tons. The French government proposes also to transform a number of old warships of an obsolete class into colliers, among them the BRUIX, the LATOUCHE-TREVILLE, the DUPLEIX and the FRIANT.

\* \* \*

## Calais Port Equipment

There has just been added to the port equipment of Calais, France, 15 electric cranes coming from the British army installation made during the war.

\* \* \*

## One Form of Subsidy

The French government has practically subsidized and ordered from French

yards, 14 steamers. The ship plates and frames for these have been guaranteed the builders at 50 francs per 100 kilograms for the former and 44 francs for the latter. In view of the current ruling prices of the same commodities—123 francs for the first named and above 100 for the latter—this is a subsidy in all that the word implies, for it is unthinkable that private enterprise in war-racked France could possibly produce on any other basis.

\* \* \*

## Belgium's Progress

The total tonnage of ship movements of the port of Antwerp in 1919 was 5,300,876 as compared with 14,146,189 in 1913. A recent report of a month's entries shows the nationality of vessels as follows: Great Britain, 264; Belgian, 48; American, 27; German, 12; Dutch, 20; Norwegian, 19; Swedish, 16; French, 12; Danish, 9; Japanese, 7; Spanish, 3; Finnish, 3; Brazilian, 2; Greek, 1; Russian, 1; Uruguayan, 1.

\* \* \*

## Finnish Activities

During the past year Finland has been reviving the building of wooden ships. It is estimated that more than 100 vessels of between 300 and 1600 tons deadweight are either completed or nearing completion. These vessels are fitted in most cases with the diesel or Bolinder's type of propelling machinery; motor-driven windlasses, winches and pumps being supplied locally or by Swedish firms. Apparently the British and American makes of motors are not well known in Finland, although some fittings have been obtained from Great Britain. Finland is confident that these ships will play an important part in increasing her exports.

\* \* \*

## Big Frame Casting

The Australian government has just placed a large contract with a Queensland firm for the steel stern and rudder frames for the 6000-ton government standard screw steamers now being built at various dockyards in Australia. The height of these frames is over 40 feet, their breadth is 20 feet and their weight 13 tons—they are some of the largest castings ever made in Australia. Eleven of the 18 sets had been delivered by Jan. 1, two were awaiting final inspection and the remaining five were in various stages of manufacture. The physical properties of the material used and the tests of the finished article are in accordance with the official plans and specifications and the requirements of Lloyd's registry.



# Why Young Men Should Go to Sea

Good Wages, Excellent Living Conditions and Chance to See  
the World Unite Now With Opportunities for Rapid Promotion

BY FRED B. JACOBS

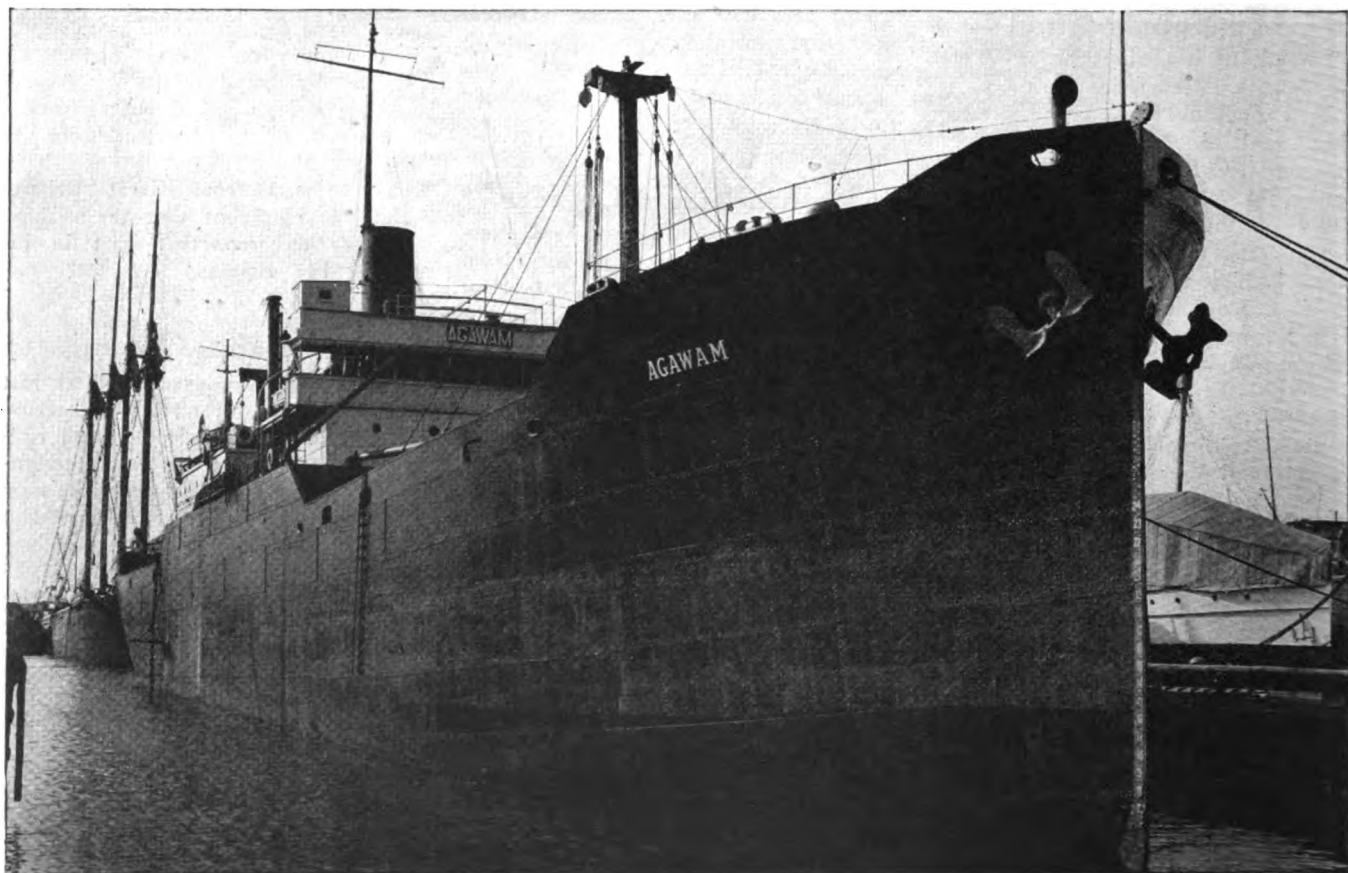
MUCH has been written of the sea. In fact, nautical themes seem to be popular with authors of fiction due possibly to the fact that what the majority of those ashore know, or think they know, about the sea is gained from highly colored narratives. If one chooses a typical sea yarn of the present day, say London's *Sea Wolf*, Bullen's *Cruise of the Cachalot*, any of Morgan Robertson's sea stories, or even that classic of the sea, Dana's *Two Years Before the Mast*, he is inclined to form the opinion that those who follow the sea are about as choice specimens of manhood as ever were unchanged. In the good old days of wind-jammers there were, of course, just such men as Jack London pictured in *Wolf Larsen*. London was no parlor sailor—he had followed the sea and he knew what he was writing about. It is true that even as short a time as 25 years ago some burly, big-fisted mates worked their way aft simply because they did have big fists and knew how to use them. This is the mate of fiction.

Times have changed, however, and they have brought about a great improvement in conditions. Today, America is equipping one of the greatest merchant fleets the world has ever known. Once again, the Stars and Stripes are seen floating over American bottoms in every port throughout the habitable globe. This remarkable revival has opened a new field of endeavor for red-blooded American boys and young men, for to man this large merchant fleet requires thousands of strong-bodied, keen-minded Americans. The old order of things has passed away. Seamen are no longer kicked about, underfed, spread-eagled in the rigging for minor offenses as some were under some flags in times past, for if the truth must be known, life at sea a score of years or more ago was not a bed of roses by any means. Yet, strange as it may seem, the average inland youth is likely to think of all ships' officers as tyrants and to accept as true any overcolored statements. For this reason, he does not always look with favor upon the romantic sea as a calling.

Present-day life at sea is as different from such a picture as black is from white. Men at sea are given as much consideration as those on shore. The living conditions are excellent. The food served to the crews on American merchant ships is far better and is more plentiful than the average workingman ever gets ashore while the chances for advancement for an ambitious man who wishes to work up are unexcelled.

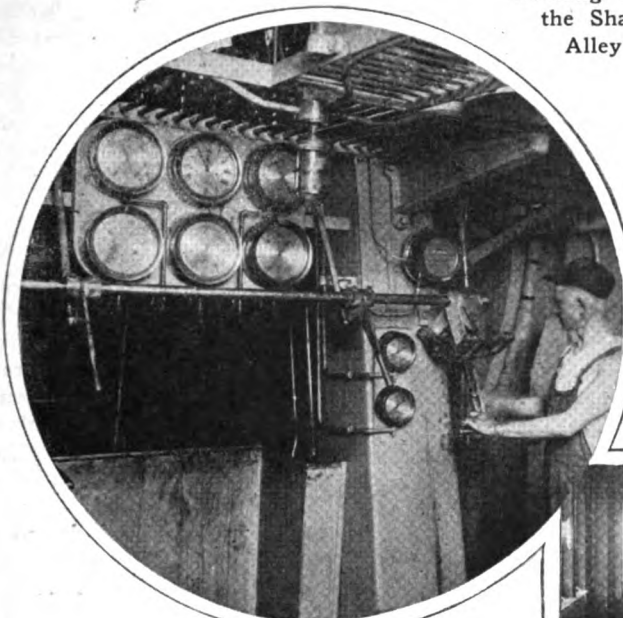
Some boys go to sea purely to satisfy an inherent love of adventure. Others take to the sea because they realize that the opportunities for working up to an officer's berth are good—and the chances were never better than they are at present aboard the new steamers of the American merchant fleet.

The young man who desires to take to the sea has two courses open to him. He can ship on a sailing vessel as a boy or a green hand where he will gradually learn the mysteries of handling sailing vessels, or he can begin his career on a steamer. As a matter of fact, the young man who

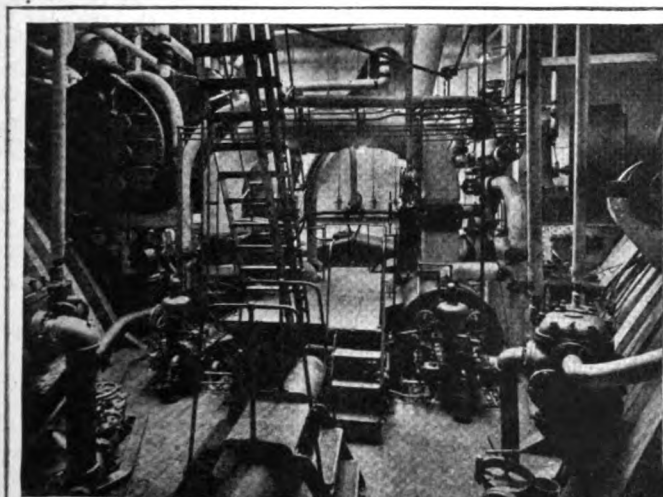


TYPICAL DEEPWATER SHIPPING BOARD VESSEL, THE AGAWAM, FIRST FABRICATED SHIP TO BE PLACED IN COMMISSION

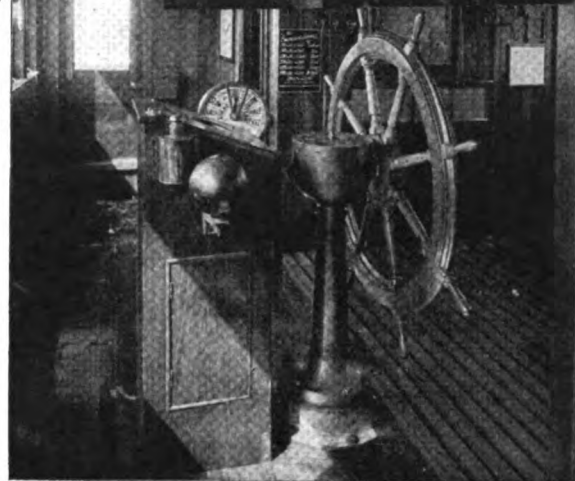
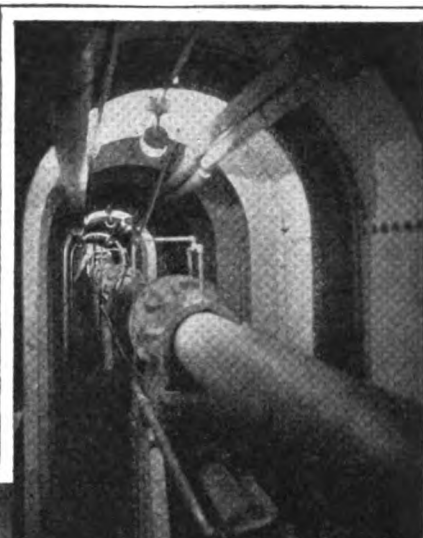
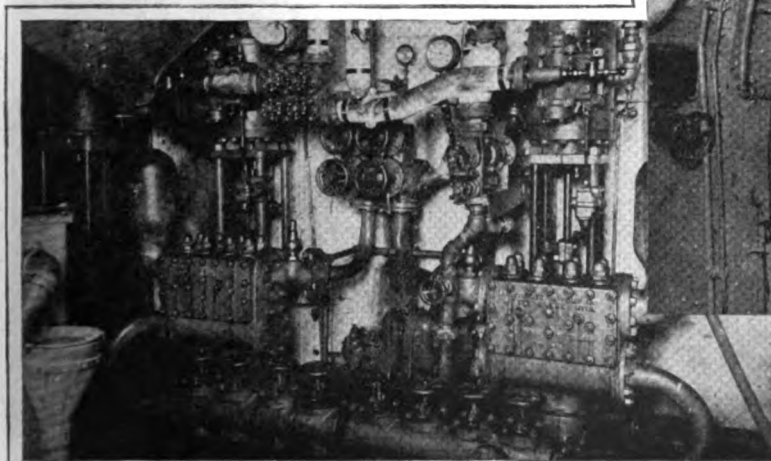
Looking Down  
the Shaft  
Alley



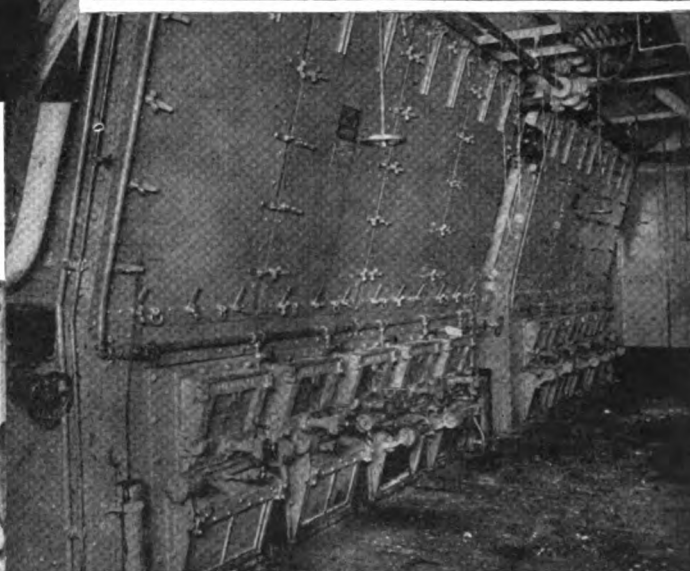
Chief Engineer Charles Brown at the handling gear of the  
Shipping Board steamer Lake Farmingdale



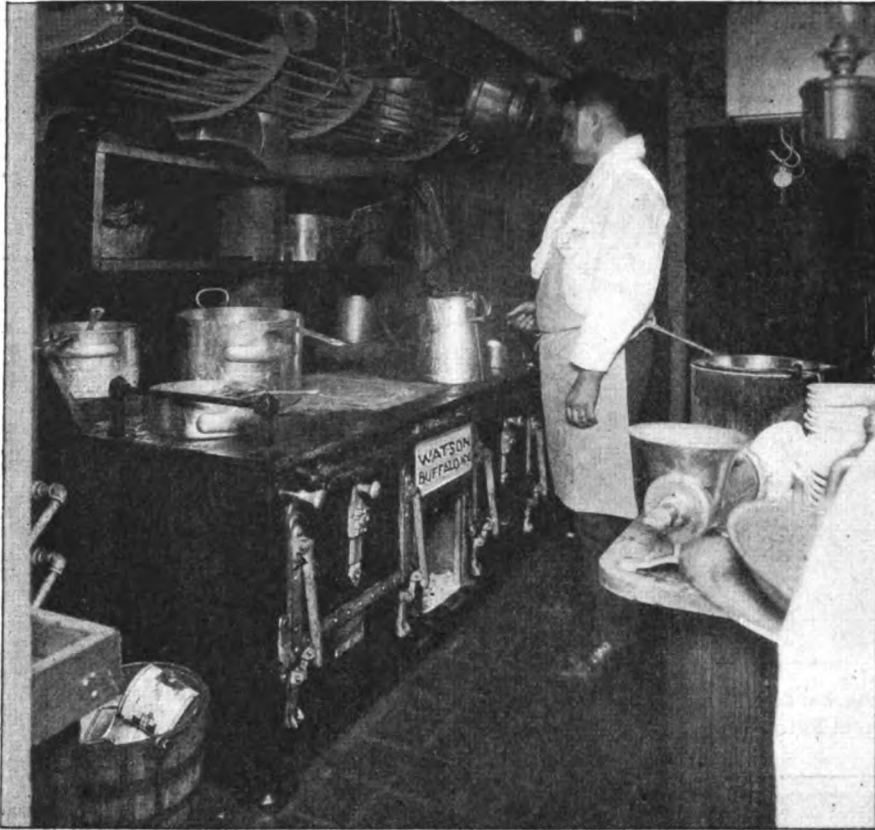
Boiler feed pumps on a cargo carrier



Above, wheelhouse of the ship-  
ping board steamer, Lake Fari-  
bault—At the left, engine room



Boiler fronts aboard an oil burner



GALLEY ON THE LAKE FARMINGDALE, A SHIPPING BOARD VESSEL—HERE MEALS FOR THE SHIP'S COMPANY ARE PREPARED UNDER THE MOST SANITARY CONDITIONS POSSIBLE

has a sincere desire to become a seaman cannot do better for a start than to ship on a square rigged deep water vessel (if he is fortunate enough to find one) for aboard such a craft he will be taught seamanship of the highest order. A year or two spent aboard such a craft should teach him how to hand, reef and steer at least and these qualifications will prove of unlimited value in after life even if he becomes an officer on a steam vessel. It is a fact that many officers of steamers have served on sailing vessels in their early careers and the experience thus gained is a valuable asset. Any sea captain will vouch for this fact.

#### Opens Definite Career

Aboard a sailing vessel a young man has a definite career open to him. He can work up through the grades of deck boy, ordinary seaman, able seaman, boatswain, third mate, second mate, first mate and then to a captain's berth. Of course, this means work and a lot of study. However, it is worth the undertaking for one who has the romance of the sea in his blood. It has been often stated that American boys now seldom go to sea aboard sailing vessels. This statement is open to exception. Could a census be taken of all the families living on or near the Atlantic coast from Eastport, Me., to the Virginia capes, it would disclose the fact

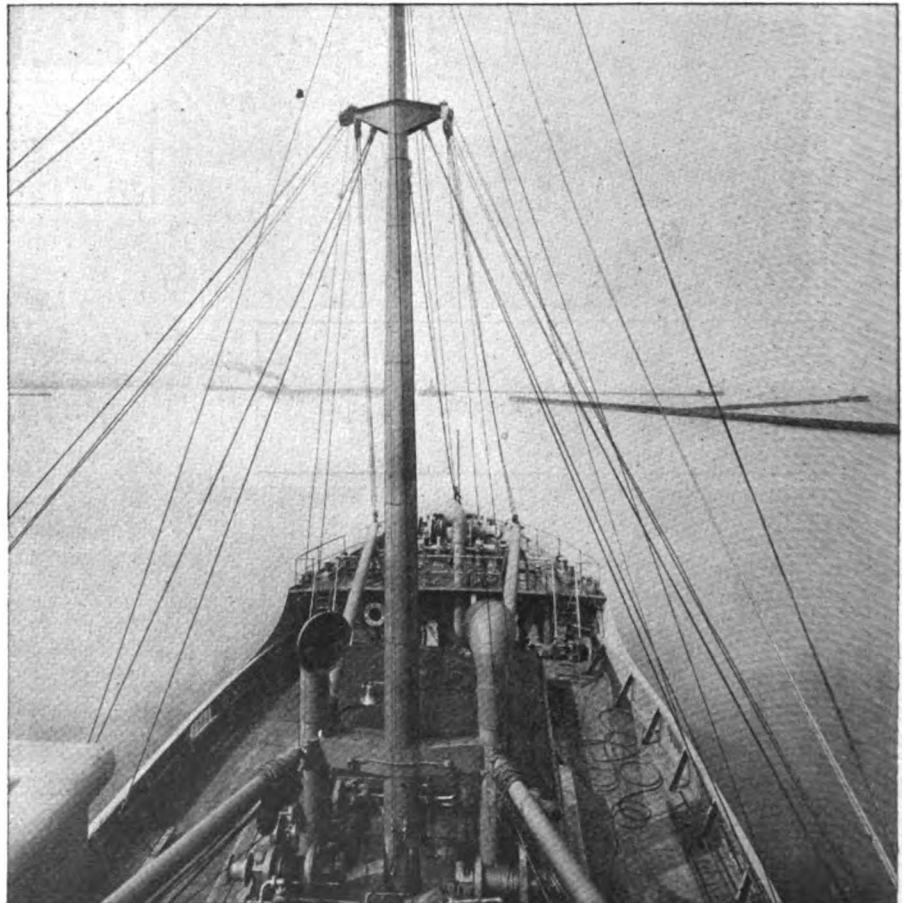
that many homes had sailor sons who were serving aboard windjammers in one capacity or another.

However, the great majority of the young men who are taking to the sea today will serve aboard steam vessels. The reason is simple as the number of steamers is far greater than sailing vessels.

#### How to Get to Sea

One way to get to sea is for a young man to slip away from home without his parents' consent, make his way to the nearest seaport and attempt to get some master to sign him on the ship's articles. This is a poor way, both for the boy and his family. In addition, it is an exceedingly difficult procedure to get a ship's officer to sign on a minor without his parents' written consent. A better way is for the young man to leave a clear understanding at home on the question before he makes the attempt.

Arrived at a seaport, one way to proceed is to go aboard the vessels lying at the docks, ask for one of the mates, and find out from him what the chances are of being taken on. Another way is to visit the shipping offices such as large steamship companies maintain both on the coast and



LAKE GILT EDGE. A SHIPPING BOARD VESSEL IN CLEVELAND HARBOR, LOOKING FORWARD FROM THE BRIDGE



on the lakes. The Standard Oil Co. has a shipping office on Pearl street, New York, as an illustration, while the United States shipping board maintains shipping offices in several seaports. Of course, it takes nerve to get to sea in this direct manner. Another way is to join the shipping board's training system. Information on this system can be obtained from the various stations or direct from the shipping board at Washington. If the young man comes within satisfactory limits as to weight, etc., he can get a few months' training on one of the board's vessels, afterward being sent to sea.

### Must Have Good Eyesight

The young man should make sure of a few points, however, before he tries to force his way into the merchant service by the direct method. His eyesight must be good as otherwise he will not be able to pass the necessary subsequent examinations for working up in the service. Also, he must possess a strong, healthy body, must not be afraid of hard work, and must possess the disposition to obey orders willingly and quickly.

A number of opportunities are open for a young man on a deep water steamer. He can start in as a wiper in the engine room, being promoted to oiler, then third assistant engineer, second assistant engineer, first assistant engineer and then chief engineer. If he is strong, he can start in as a coal passer and work his way up to water tender after which he is promoted to the engine room. Coal passing and firing are hard work but the experience thus gained is valuable to the future engineer. It is not necessary to have had experience at coal passing or firing to become an engineer, however, as many engineers start in as wipers and oilers.

At the present time, many vessels are being equipped as oil burners. This lightens the fireman's work considerably. Thus, the young man who has an opportunity to serve in the fireroom of an oil burner will gain valuable experience without the back breaking, hard work that is necessary in the fireroom of a coal burner.

How about the man on deck? Well, he starts as a deck boy or green hand after which he works up to an ordinary seaman, able seaman, quartermaster, third mate and so on until he is a captain. This, of course, takes time and a determination to get ahead. Perhaps, the young man would like to be a hotel man at sea. In this case he starts in the steward's department as an apprentice to work up through several grades until he is a

## Wages Paid on United States Shipping Board Vessels

|                         |                  |                        |                       |                      |                | Meal<br>allow-<br>ance.<br>Per<br>day | Room<br>allow-<br>ance.<br>Per<br>night | Traveling<br>allow-<br>ance.<br>Per<br>24 hrs. | Overt-<br>time.<br>Per<br>hour |
|-------------------------|------------------|------------------------|-----------------------|----------------------|----------------|---------------------------------------|---|--|--------------------------------|
| Power tonnage           |                  | 12,001<br>to<br>20,000 | 7,501<br>to<br>12,000 | 5,001<br>to<br>7,500 | Below<br>5,000 |                                       |   |  |                                |
| Single screw            | Over<br>20,000   |                        |                       |                      |                |                                       |   |  |                                |
|                         | Over<br>15,001   | 9,001<br>to<br>15,000  | 5,501<br>to<br>9,000  | 3,501<br>to<br>5,501 | Below<br>3,500 |                                       |   |  |                                |
| Twin screw              |                  |                        |                       |                      |                |                                       |   |  |                                |
| Master                  | \$412.50         | \$371.25               | \$357.50              | \$343.75             | \$330.00       | \$3.50                                | \$1.50                                  | \$5.00   | .....                          |
| 1st officer             | 241.25           | 235.00                 | 228.75                | 222.50               | 216.25         | 3.00                                  | 1.50                                    | 4.00   | .....                          |
| 2d officer              | 212.50           | 206.25                 | 200.00                | 193.75               | 187.50         | 3.00                                  | 1.50                                    | 4.00   | .....                          |
| 3d officer              | 188.75           | 182.50                 | 176.25                | 170.00               | 163.75         | 3.00                                  | 1.50                                    | 4.00   | .....                          |
| 4th officer             | 165.00           | 158.75                 | .....                 | .....                | .....          | 3.00                                  | 1.50                                    | 4.00   | .....                          |
| Carpenter               | 100.00           | 100.00                 | 100.00                | 100.00               | 100.00         | 1.50                                  | .50                                     | 3.00   | \$0.60                         |
| Carpenter mate          | 95.00            | .....                  | .....                 | .....                | .....          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Boatswain               | 95.00            | 95.00                  | 95.00                 | 95.00                | 95.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Quartermaster           | 87.50            | .....                  | .....                 | .....                | .....          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Able seaman             | 85.00            | 85.00                  | 85.00                 | 85.00                | 85.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Ordinary seaman         | 65.00            | 65.00                  | 65.00                 | 65.00                | 65.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Deck apprentices        | 40.00            | 40.00                  | 40.00                 | 40.00                | 40.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Chief engineer          | 387.50           | 346.25                 | 332.50                | 318.75               | 305.00         | 3.50                                  | 1.50                                    | 4.00   | .....                          |
| 1st assistant engineer  | 241.25           | 235.00                 | 228.75                | 222.50               | 216.25         | 3.00                                  | 1.50                                    | 4.00   | .80                            |
| 2d assistant engineer   | 212.50           | 206.25                 | 200.00                | 193.75               | 187.50         | 3.00                                  | 1.50                                    | 4.00   | .80                            |
| 3d assistant engineer   | 188.75           | 182.50                 | 176.25                | 170.00               | 163.75         | 3.00                                  | 1.50                                    | 4.00   | .80                            |
| 4th assistant engineer  | 165.00           | 158.75                 | .....                 | .....                | .....          | 3.00                                  | 1.50                                    | 4.00   | .80                            |
| Junior engineer         | 135.00           | .....                  | .....                 | .....                | .....          | 3.00                                  | 1.50                                    | 4.00   | .80                            |
| Refrigerator engineer   | 110.00           | .....                  | .....                 | .....                | .....          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Asst. Refgr. engineer   | 100.00           | .....                  | .....                 | .....                | .....          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Electrician             | 110.00           | .....                  | .....                 | .....                | .....          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Deck engineer           | 100.00           | 100.00                 | 100.00                | 100.00               | 100.00         | 1.50                                  | .50                                     | 3.00   | .60                            |
| Pumpman                 | 100.00           | 100.00                 | 100.00                | 100.00               | 100.00         | 1.50                                  | .50                                     | 3.00   | .60                            |
| Oiler                   | 95.00            | 95.00                  | 95.00                 | 95.00                | 95.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Watertender             | 95.00            | 95.00                  | 95.00                 | 95.00                | 95.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Storekeeper             | 95.00            | 95.00                  | 95.00                 | 95.00                | 95.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Fireman                 | 90.00            | 90.00                  | 90.00                 | 90.00                | 90.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Wiper                   | 75.00            | 75.00                  | 75.00                 | 75.00                | 75.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Coal passer             | 75.00            | 75.00                  | 75.00                 | 75.00                | 75.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Engine apprentice       | 40.00            | 40.00                  | 40.00                 | 40.00                | 40.00          | 1.50                                  | .50                                     | 3.00   | .60                            |
| S.S. carrying 3 R. Eng. | First 177.50     | Second 158.75          | Third 121.25          | .....                | .....          | 1.50                                  | .50                                     | 3.00   | .60                            |
| S.S. carrying 2 R. Eng. | 171.25           | 152.50                 | .....                 | .....                | .....          | 1.50                                  | .50                                     | 3.00   | .60                            |
| Chief steward           | Class 1 \$160.00 | Class 2 \$145.00       | Class 3 \$135.00      | Class 4 \$115.00     |                | 1.50                                  | .50                                     | 4.00   | .60                            |
| 2d steward              | 95.00            | 95.00                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Chief cook              | 135.00           | 125.00                 | 115.00                | 110.00               |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| 2d cook and baker       | .....            | .....                  | 100.00                | 100.00               |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| 2d cook                 | 100.00           | 100.00                 | 85.00                 | 85.00                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| 3d cook                 | 90.00            | 70.00                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Vegetable cook          | 75.00            | .....                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Cooks mate              | 70.00            | 70.00                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Baker                   | 115.00           | 105.00                 | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| 2d baker                | 85.00            | .....                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Steam cook              | 85.00            | 85.00                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Butcher                 | 95.00            | 95.00                  | 95.00                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| 2d Butcher              | 85.00            | .....                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Storekeeper             | 85.00            | .....                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Pantryman               | 75.00            | .....                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Scullion                | 70.00            | .....                  | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Endman                  | 70.00            | 70.00                  | 70.00                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Messman                 | 70.00            | 70.00                  | 70.00                 | 70.00                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Deck messboy            | 65.00            | 65.00                  | 65.00                 | 65.00                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Engine messboy          | 65.00            | 65.00                  | 65.00                 | 65.00                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Stewards messboy        | 65.00            | 65.00                  | 65.00                 | 65.00                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Steward apprentice      | 40.00            | 40.00                  | 40.00                 | 40.00                |                | 1.50                                  | .50                                     | 4.00   | .50                            |
| Doctor                  | 150.00           | 150.00                 | .....                 | .....                |                | 1.50                                  | .50                                     | 4.00   | .....                          |
| Chief radio operator    | 125.00           | 125.00                 | 125.00                | 125.00               |                | 3.00                                  | 1.50                                    | 4.00   | .....                          |
| Asst. radio operator    | 100.00           | 100.00                 | 100.00                | 100.00               |                | 3.00                                  | 1.05                                    | 4.00   | .....                          |

Classification of the deck and engine departments are based on power tonnage as shown in the American registry. Power tonnage is the gross tonnage plus the indicated horsepower and the tonnage for each class is indicated in the above table.

Classification of the stewards department is determined as indicated below.

CLASS 1.—Consists of overseas vessels with a substantial and available passenger accommodation in use, having a complement of 150.

CLASS 2.—Consists of coastwise and overseas vessels, including horse transports with substantial and available accommodations in use for passengers or crew attendants, having a crew complement of over 100 and less than 150.

CLASS 3.—Consists of coastwise passenger vessels with a crew complement of less than 100 and all freighters running overseas and to the West Indies, Central America, South America, Canadian and New Foundland ports.

CLASS 4.—Consists of freighters running between the United States ports and Atlantic coast and Gulf ports. Special class for troop transports.

chief steward. Many are of the opinion that a steward's post entails only menial work fit solely for tip-seekers. This is a mistake. The steward's calling is as honorable as any other. In fact, the chief steward on an ordinary steam vessel holds a responsible position not unlike that of a hotel manager ashore. Of course, on a passenger liner, the steward's work is quite complicated.

How much money is there in these sea jobs is a query that every one is

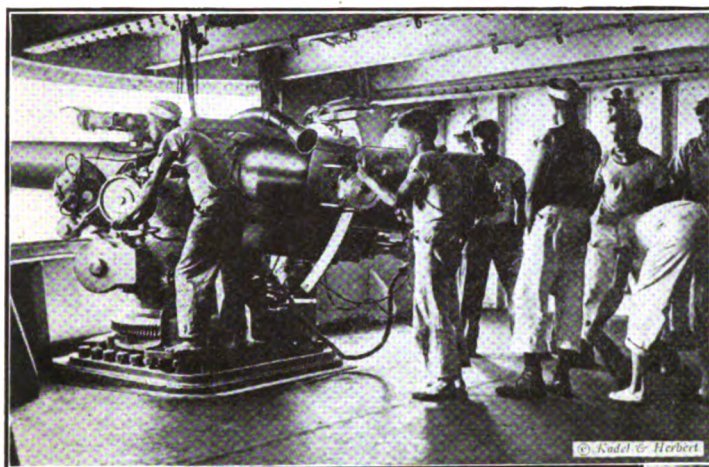
bound to ask. The accompanying table, furnished by the United States shipping board gives the latest figures in detail. A study of this table shows that the wages paid at sea compare excellently with those paid ashore. Again it must be borne in mind that while at sea the young man has his board and lodging free. He is "found" as the expression is.

What are the chances for success in making the sea a life profession?

(Concluded on page 293)



# Latest Marine News in Pictures

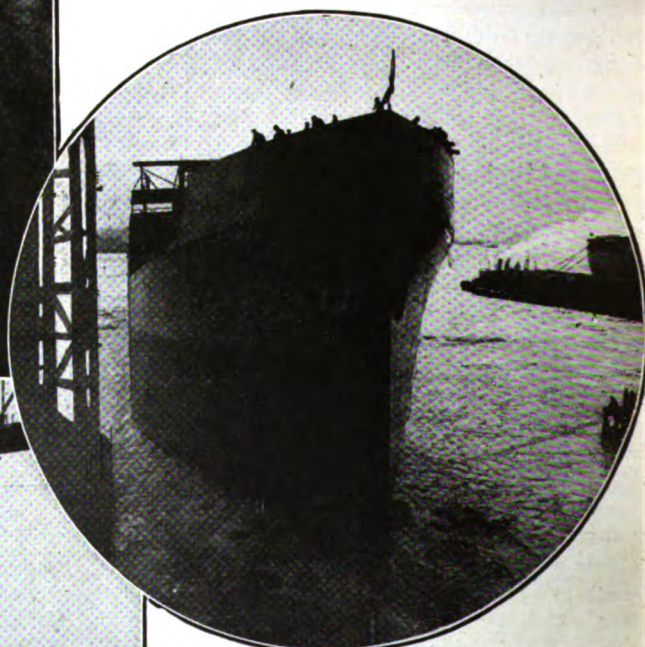


At Uncle Sam's submarine base at New London, Conn., all intricacies of submarine warfare are being taught to new recruits. Here future submariners are dissecting the works of a torpedo

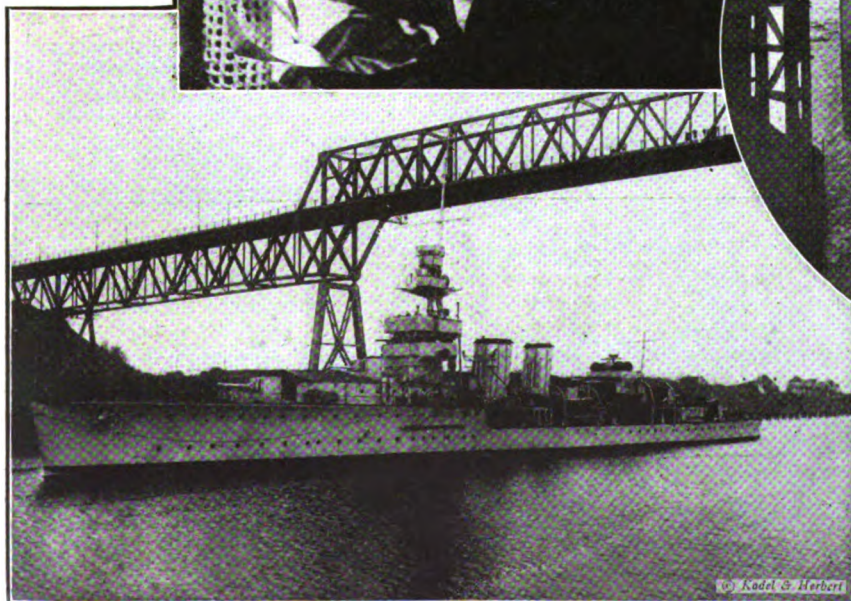
The superdreadnaught Arizona is the champion shot of the American navy. This crew has nine white E's (for excellency) on the Arizona's secondary battery of 5-inch guns



Miss Louisa Hughes, daughter of Rear Admiral C. F. Hughes, commandant of the Philadelphia navy yard, christened the Pan Handle State, recently launched at the Camden, N. J., yards of the New York Shipbuilding Corp.



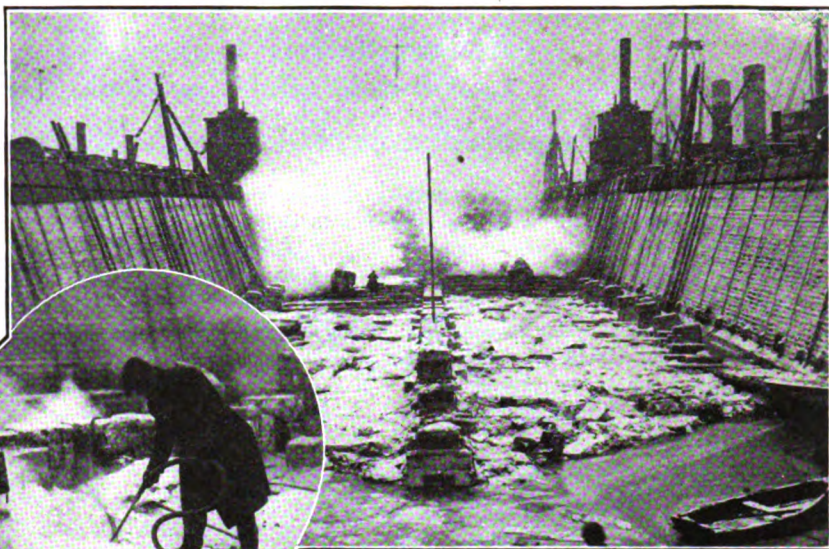
The famous British cruiser Coventry is here shown on her arrival at Kiel with the allied commission delegated to inspect the remains of the German fleet. For the deliberate sinking of the fleet at Scapa Flow the Germans must turn over to the allies many warships and merchant vessels



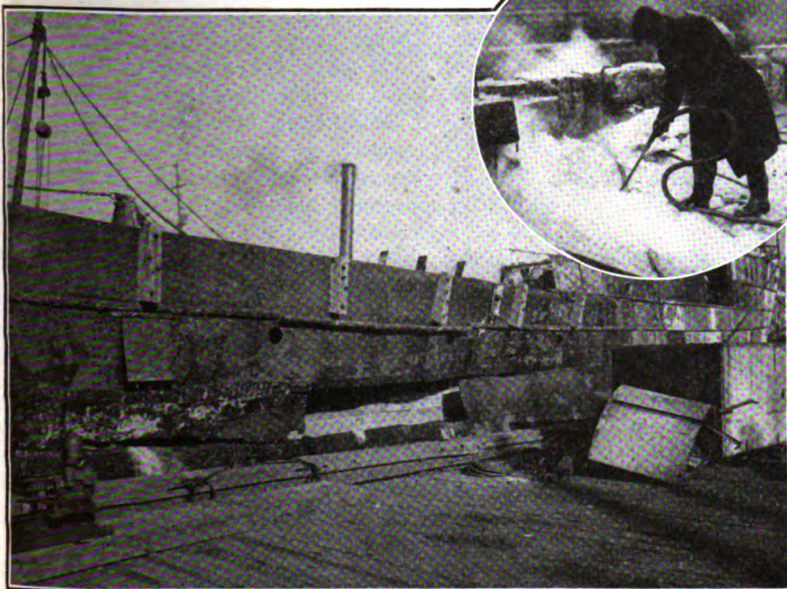


# Photographs From Far and Near

Zero weather presented no obstacles to the ship repairmen at the Tietjen and Lang yard, Hoboken, of the Todd Shipyards Corp. The dry-docks were thawed out every morning with steam, and work went ahead as usual



In thawing out frozen drydocks, making winter operations practicable, steel nozzles are forced into the ice and steam then turned on



Battered plates of the Powhatan, rammed and sunk in Chesapeake bay, are torn away and replaced by ship repairers of the Morse Dry Dock & Repair Co., Brooklyn



Liner and dredge pass in the Suez canal



Bunks, hospital wards and other fittings are removed from troop transports to permit of their reconversion to merchant vessels



Admiral Rodman has a dog named Mick, and every evening at sunset Mick, under the shadow of the 14-inch guns on the U. S. S. New Mexico looks to sea, for what—"Nobody knows, nobody cares"



# Bits From the Log of Progress

Events of Interest to Those Engaged in Operating,  
Constructing and Outfitting Yards and Ships

**S**IX OVERSEAS steamship lines, operating out of Seattle, composed of government owned steel freighters are contemplated or in operation, according to government advices recently received in Seattle. These lines would link Seattle with United Kingdom ports, South America, Asia, Australia, New Zealand and the Straits Settlements. One of the routes planned is from Seattle to Buenos Aires via the Straits of Magellan. This route is approximately 1000 miles shorter than by way of the Panama canal. A vessel a month will be placed in this service which is to be established in the near future. Another new shipping board route to which vessels have been assigned is from Seattle to ports in Mexico, Central America and South America via San Francisco. The General Steamship Corp., Seattle, will act as manager and operator of this line. Shipping board vessels now operating out of Seattle go to Japan, China, Siberia and the Philippines, Straits Settlements and Europe.

\* \* \*

STEVEDORING CHARGES at River Plate ports have been advanced and charters are requiring shipowners to pay 2s per ton for discharging. Formerly the rate was 1s 6d.

\* \* \*

THE INTERNATIONAL Mercantile Marine Co. handled 18 large steamers loading and discharging general cargo in Philadelphia during February. This company is interested in the movement now under way to increase the port facilities of Philadelphia. As conditions warrant, the International company intends to increase its sailings from that port.

\* \* \*

ALTHOUGH THE world ship tonnage is greater than it was before the war, the service rendered is not more than half of what it was formerly, according to J. H. Rosseter, former director of operation of the shipping board. Mr. Rosseter made this statement recently to the senate committee. Delays of various kinds have reduced the general efficiency of vessels. Notable among the delays are strikes in a number of countries. Mr. Rosseter is strongly in favor of a "bargain" sale of the wooden ships owned by the government at a rate of \$50 a ton, without restrictions as to flag or trade. He stated that the wooden

vessels were a mistake from every viewpoint.

\* \* \*

PIER CONGESTION at Boston is reported as serious and heavy losses have been incurred by shippers who have been unable to get consignments to the piers in time to connect with certain steamers. Inability to move cars from the west has resulted in most of the grain elevators at Boston having but little export grain left. A large amount of grain originally routed for Boston has been diverted to New York and other ports for shipment.

\* \* \*

SHIPMENTS OF Egyptian cotton received in New England so far this season have been the largest in history. The British steamer IKALA came from Alexandria with 10,975 bales of cotton.

\* \* \*

DEFINITE ANNOUNCEMENT has been made that the Masset Lumber Co., Seattle, will test the plan of towing lumber to the United Kingdom in the form of a gigantic raft. Two Swedish experts have been engaged by the company to build the rafts which will go from Puget sound by way of the Panama canal. It is expected that 10,000,000 feet of lumber will be transported in the first experiment. It will be late summer before the first raft gets away.

\* \* \*

SEVEN WOODEN steamers of the shipping board fleet are now plying between England and continental ports and are reported as giving excellent results, according to word received from managers and operators of the steamers. It is said that more wooden steamers will be placed in this service in the near future.

\* \* \*

IN REGARD to the prospect of freight rates becoming lower, opinions are expressed by the Swansea Shipping exchange that if all tonnage now lying idle could be cleared, freights would soon come down. The present high freight rates are attributed to short working hours and men not doing the amount of work they could in a given amount of time. This results in traffic congestion and rates are necessarily high to cover the cost.

\* \* \*

THE CHAMBER of commerce of Zanesville, O., and business interests of that section of the Buckeye state have begun

a campaign in support of the Great Lakes - St. Lawrence - Atlantic waterway project and the Lake Erie-Ohio barge canal for the Mississippi river and Gulf of Mexico traffic.

\* \* \*

BUSINESS RELATIONS between the United States and Siberia are at present neither safe nor profitable, according to a recent statement of Maj. Gen. I. Thord-Gray, formerly a shock division commander of the Russian forces operating against the reds. He spoke at a meeting held in Seattle under the auspices of the Foreign Trade club and the Siberian committee of the foreign trade bureau, Seattle chamber of commerce. The fact was brought out that German and Japanese firms are especially active in getting business lined up in Siberia and that the United States should follow suit if it expects to gain a share of the immense business that is bound to develop as soon as conditions in Russia are more settled.

\* \* \*

JUDGMENT FOR \$830,121.12, alleged damages, and appointment of a receiver for the Patterson McDonald Shipbuilding Co. were asked in a suit filed recently in the superior court at Seattle, by Mark Sheldon, as commissioner of the commonwealth of Australia in the United States. It is asserted that \$400,000 will be needed to complete the contract for 10 ships entered into on Dec. 18, 1918, and that the corporation has closed its yards. The complaint recites that a contract for 10 ships was entered into by the company with the commonwealth of Australia, the cost price of the vessels to be \$8,000,000, less certain commissions.

\* \* \*

THE STEAMSHIP MATTOLE, a bulk oil carrier, recently was launched by the William Cramp & Sons Ship & Engine Building Co., Philadelphia. The vessel was sponsored by Miss Helen Louise Taylor, 9-year-old daughter of H. Burchard Taylor, vice president of the company. This vessel was built for the Emergency Fleet corporation and is 430 feet long, 58 feet beam and 33 feet deep. She has a carrying capacity of 10,000 tons, deadweight cargo. The keel was laid on June 2, 1919. Miss Taylor was presented with a diamond studded bracelet by the shipbuilding company.

# Bits From the Log of Progress

Events of Interest to Those Engaged in Operating,  
Constructing and Outfitting Yards and Ships

**D**RIVEN before a 70-mile gale and powerless to help herself, because of a broken propeller, the shipping board steamer LAKE ELLITHORPE narrowly escaped destruction recently on the shoals of Sable island. The vessel registers 4000 tons. She sent out wireless calls for help which were picked up by the MAPLEMORE, more than 120 miles away. This vessel answered the message and started toward the disabled vessel. The coast guard cutter SENECA also picked up the calls for help and started toward the ELLITHORPE. Before either rescuing craft sighted her, another wireless message was received that the vessel had just cleared the rocks and was out of danger.

\* \* \*

CABLE SERVICE recently was resumed between British Columbia and Australasia, according to a recent announcement from the Seattle office of the Postal Telegraph Cable Co. The cable went out of commission recently due to a break east of Suva. Repairs were completed as soon as possible. The cable from the Pacific coast to the Orient is still out of commission, due to a break near Midway. Oriental messages are sent by way of Europe.

\* \* \*

FREIGHT RATES on ocean shipping from England will be increased 50 per cent, according to the *London Times* in order to meet the high cost of coal in the United Kingdom. Coal at London is costing £1 15s a ton compared with 15s to 19s before the war. This same coal is obtained by English industrial plants for 40s a ton.

\* \* \*

THE PACIFIC Steamship Co. is now operating 17 steel, shipping board vessels, seven out of Portland, Oreg., and 10 out of Seattle. These vessels are operated in the transpacific trade. The fleet is said to be the largest ever operated on regular schedule on the route that links Seattle and Portland with China, Japan and the Philippines. Representatives of the company have completed arrangements for inaugurating a regular 28-day service between Seattle and Singapore.

\* \* \*

FIVE LARGE wooden ships recently purchased by the National Oil Co., New

York, have left Lake Union, Seattle, and have been towed to the Meacham & Babcock plant in Salmon bay. Two of the vessels, the BROXTON and the SNOQUALMIE register 5600 tons while the AGRON, EDRIA and AGYLLA register 4700 tons each. These vessels will be completed as steamships.

\* \* \*

CAPT. ANTON G. Thompson, 71, veteran transatlantic navigator and commodore of the Scandinavian-American fleet, sailed recently on his 223rd round trip transatlantic voyage. This is the skipper's last voyage and he is to retire to take up life ashore. He will join the rocking chair fleet of Danish skipper, with a pension from his employers.

\* \* \*

ESTABLISHMENT of a new freight line between Baltimore and the Pacific coast is planned by the Gulf & Pacific Steamship Corp., according to a recent announcement. This is a new corporation recently formed in Baltimore. The line expects to begin service with approximately five 8500 to 9500-ton cargo carriers. Several passenger and combination passenger and freight vessels may be added to the fleet later.

\* \* \*

FOR OPERATION in the Arctic ocean, Capt. Alexander Allan, recently bought the schooner OLGA from Capt. C. T. Peterson, San Francisco. The new owner will install an engine in the vessel and as soon as the ice has cleared away he will set sail for Behring Strait and the Arctic eastward beyond Herschel island. The OLGA is a staunch wooden schooner, practically of the same size as the famous Seattle craft, BENDER BROTHERS, which has been voyaging into the Arctic for a number of years. The OLGA has a cargo carrying capacity of 200 tons, is 76 feet long and 20 feet beam.

\* \* \*

SEVENTEEN DAYS from Kahului, the bark BELFAST arrived recently at Port Townsend, Wash., reporting an excellent voyage from Hawaii. She carried a cargo of nitrates from Pisagua, Chile, and completed her voyage to this country in ballast. She will drydock at Seattle for an overhauling.

\* \* \*

SEVERAL HUNDRED gallons of wine consigned by a Hongkong firm to Van-

couver, B. C., reached Seattle recently from the Orient in bond aboard the steamship WEST IVIS. The valuable cargo will be trans-shipped. The WEST IVIS is managed and operated by Srtuthers & Dixon for the United States shipping board. She brought in a full cargo including hemp, rice, matting, vegetable oil and straw hats.

\* \* \*

THE UNITED STATES is facing a big problem in supplying oil for its merchant marine during the coming two years. In the face of a world shortage of oil, the government is confronted with the problem of supplying its merchant marine with 50,000,000 barrels of oil a year, according to a recent statement of Franklin K. Lane, formerly secretary of the interior.

\* \* \*

REVIVAL OF activity at the port of Hamburg is reported in official advices to the bureau of foreign and domestic commerce. Shipping services to the number of 37 have been definitely re-established. Of these, four are to the Atlantic and one to the Pacific coast of the United States; to great Britain, seven; France, one; Holland, four; Belgium, two; Cuba and the West Indies, three; Mexico and Central America, two; South America, eight; Africa, one and Asia, four.

\* \* \*

AFTER BEING laid up for more than 60 days for a thorough, annual overhauling in preparation for the heavy business the Grand Trunk Pacific will handle during the coming summer, the steamer PRINCE RUPERT, one of the finest passenger steamers plying in the Seattle trade, arrived at that port recently and left immediately for Vancouver, Prince Rupert and Anyox, B. C. The PRINCE RUPERT is replacing the PRINCE GEORGE which is now undergoing an annual overhauling.

\* \* \*

THE NORTH & SOUTH line, operated by P. Kleppe & Co., New York, recently dispatched the steamer LUISE NIELSON from New York to Rio de Janeiro, Santos and Buenos Aires with 6200 tons of general merchandise. The vessel completed loading in eight days and sailed early in March.

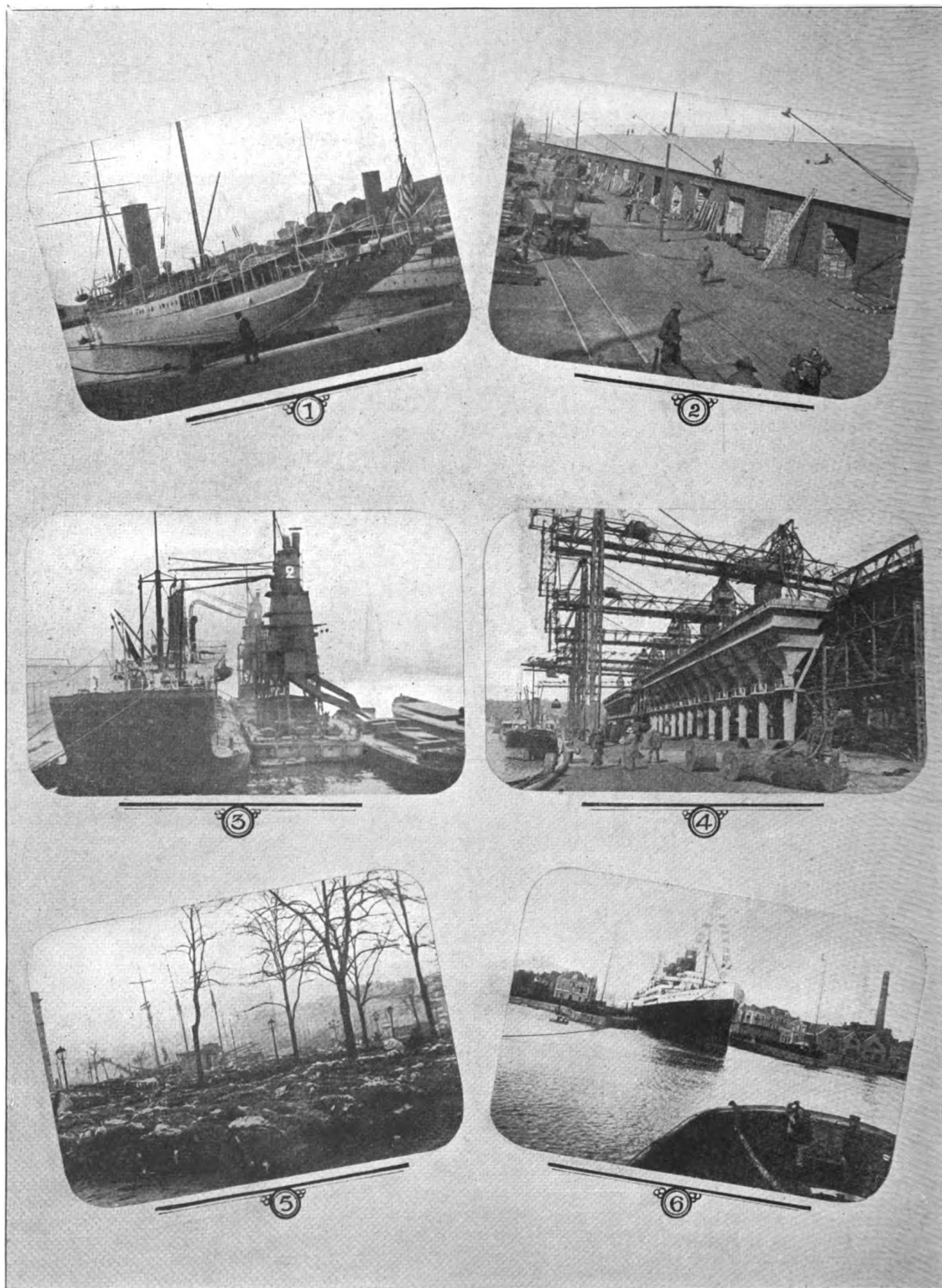


FIG. 1—HARBOR SCENE AT CANNES—VESSEL IN THE FOREGROUND IS ROBERT GOELET'S YACHT NAHMA FIG. 2—WAREHOUSE EQUIPMENT ERECTED BY THE AMERICAN FORCES AT ST. NAZAIRE FIG. 3—DIMINUTIVE GRAIN ELEVATORS AT LE HAVRE FIG. 4—UNLOADING COAL AT BORDEAUX FIG. 5—QUAY SPACE AT LE HAVRE IS INADEQUATE SO SEVERAL CARGOES OF COTTON ARE STORED IN THE STREETS FIG. 6—LINER FRANCE LEAVING ST. NAZAIRE ON HER MAIDEN VOYAGE

The

Fig. 7—

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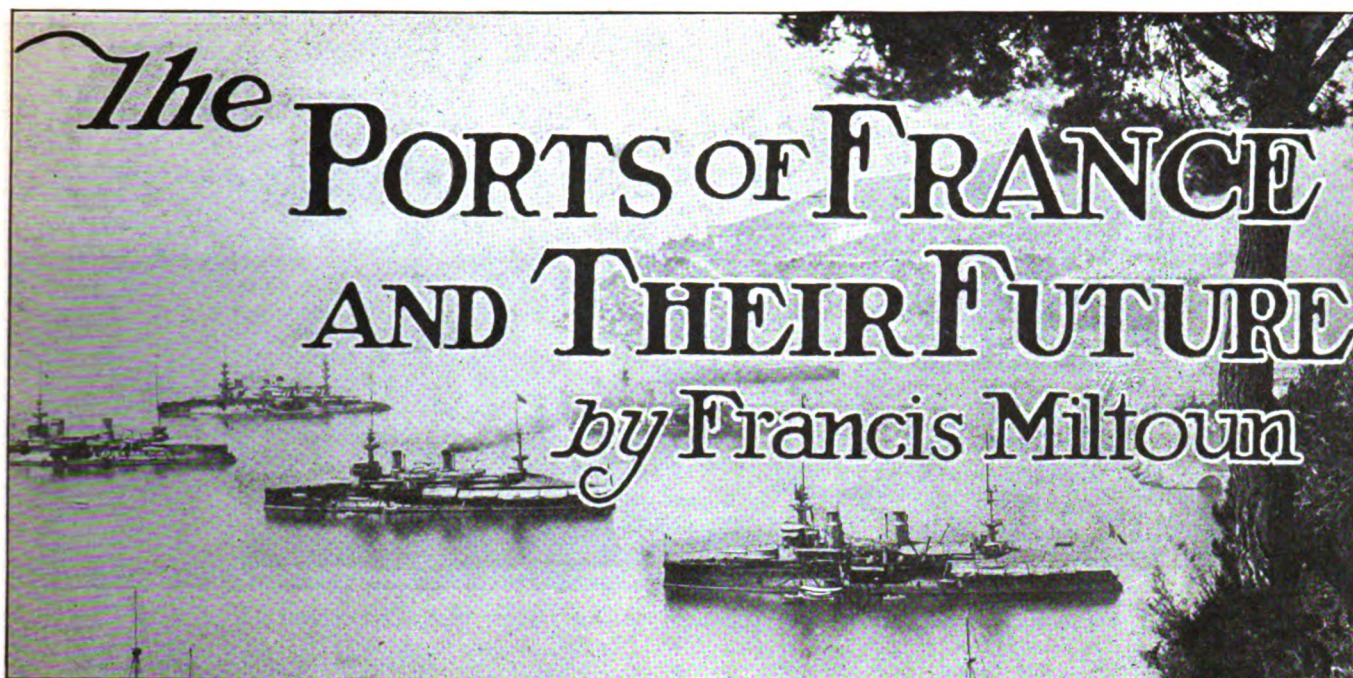


Fig. 7—France has many good harbors—This illustration shows several French naval vessels in the harbor of Villefranche

**A** REPRESENTATIVE of the United States shipping board, at a recent banquet of the American club in Paris, stated that "the development of French ports is of intense interest to Americans."

The whole question is there. French ports in the past have been inadequate in their appointments and equipment to serve the growing commerce of the world which made use of them. A more generous and liberal governmental control of policy will be needed before they will, in any satisfactory measure, be able to fill the still growing demands upon them.

For its area, France is more than amply endowed with seaports. Perhaps it is for this reason that none of them has been developed up to its required capacity. A dozen ranking ports range from Marseilles—the greatest of Mediterranean gateways of all the powers surrounding the Mediterranean lake—Bordeaux and Le Havre to Dieppe and Treport the miners of the English channel, so called by the English though its real name is La Manche. Leaving the port and dock equipment which the American army establishment was obliged to install at Bordeaux and Saint Nazaire out of the question for the moment, addi-

tional wharf space and cargo handling facilities and rail connections are most urgently needed in French ports. Dunkerque in the north and Marseilles in the south are already prolific in projects which will endow them with largely increased facilities. Modern cargo handling appliances and warehouses were lacking during the war and before, particularly in considering the increase in the bulk of cargo handled from year to year, no less than the growth in ship tonnage and draft.

The same is true of Le Havre (the ancient "harbor" of Francois Premier) and its auxiliary, the upriver port of Rouen. The disadvantage of the port of Le Havre is a lack of berthing space. As many as 50 ships are often to be found lying at anchor in the

roads, when the wind and sea permit; otherwise they go to sea again, awaiting the opportunity to come inside and up to the quays. Rouen suffers from the same inadequacy of berthing space, the ships lying in the lower river, or being held at Le Havre before they are allowed to come up the Seine. This is a serious matter for the provisioning of Paris as Rouen is the nearest deep-sea port to the capital. From it all cargo is transhipped to canal boats and river barges for towing up river. In the winter, owing to the strong current and the feebleness of the tow boats, the barges are often dragged one at a time, two or three at the utmost. During the summer, however, five can be handled in one tow. This is even

more true of Cherbourg, which has never been much more than a port of call. Its virtues as such were first discovered by the directors of the German passenger lines before the war, and this in spite of Napoleon's ambitions for it, and those of Vauban before him. Brest and L'Orient, on the Atlantic seaboard are in the peculiar situation of being naval bases and arsenals and commercial business is frowned down, though the former is precisely indicated as the ideal

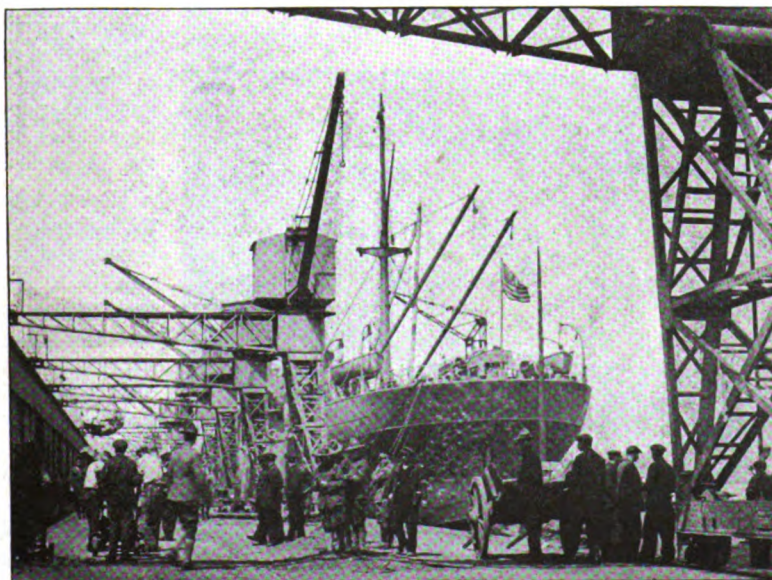


FIG. 8—AMERICAN ARMY SUPPLY SHIP AT BORDEAUX



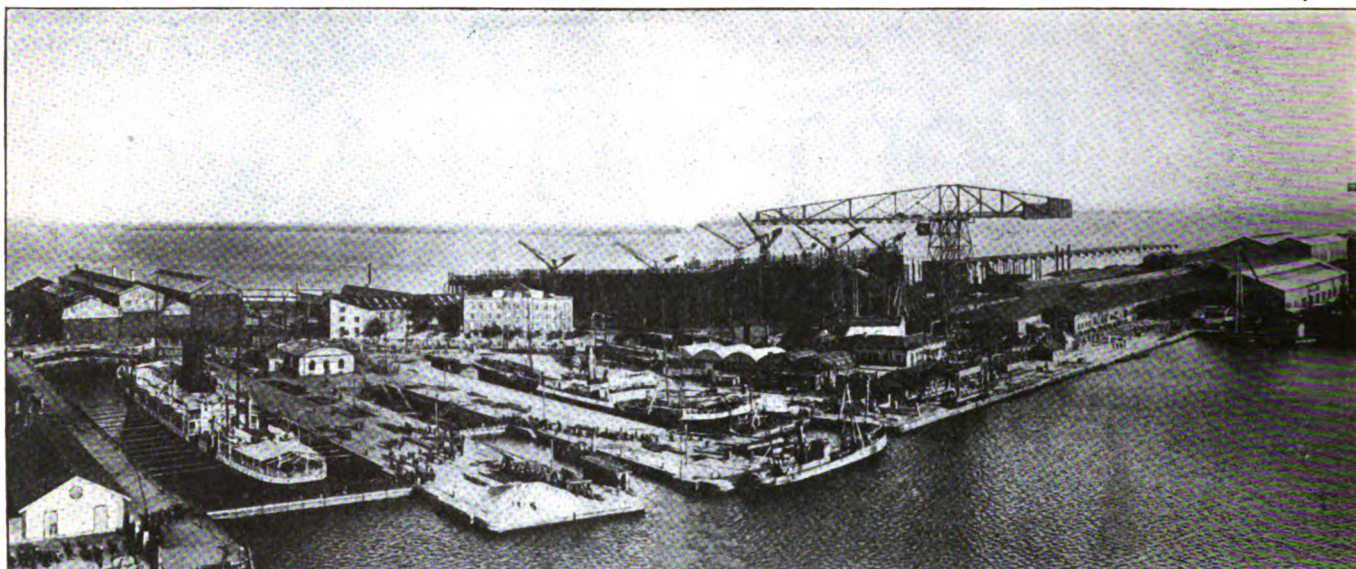


FIG. 9—WELL EQUIPPED FRENCH SHIPBUILDING PLANT—THE PENHOET WORKS AT ST. NAZAIRE

transatlantic port for passenger traffic. This is true although the entrance is usually beshrouded in a fog and the rail haul to Paris is nearly 400 miles as compared with less than 200 from Cherbourg and 130 from Le Havre.

The twin ports of Saint Nazaire and Nantes (taken together being all that Bordeaux is on one hand and Brest on the other) are perhaps proportionately the best endowed of all in view of the equipment installed by the American forces—150 warehouses and wharves accommodating 30 ships at a time. Here is the nucleus of the ideal French port, which is further admirably situated geographically with relation to the interior of the country.

La Pallice, just south of Saint Nazaire, is susceptible of playing a much bigger role than it has in the past when it was chiefly used as a coal port and a port of call for the English South American liners.

Bordeaux, in its turn, is the twin rival of Marseilles in importance, if

not in the volume of traffic. Its future is assured, and its equipment is growing proportionately with the tonnage arrivals and departures as well as with bulk of cargo handled. The chief defect at present, as is true in a large measure of all French ports, is its lack of adequate and efficient means of getting freight to and from the docks by rail.

So near to chaos were the docks of Bordeaux during the last year of the war that the American chamber of commerce of Paris appointed a representative on the spot whose sole labor was to keep merchandise moving after it was landed, and untangle as much governmental "red tape" as possible on behalf of American goods intended for French civilian consumption. He did wonders, and his efforts certainly tended to make French government officialdom and the Bordeaux port authorities alike learn the virtues of a procedure which had hitherto been undreamed of in a commercial way.

Bayonne is a minor port, famous for having first sent whalers to all the seven seas, but can well be developed to relieve the great port of Bordeaux. For the moment it does not count in the general scheme of French relations with the outside world.

Crossing Pyrenean France to the Mediterranean, Port Vendres is merely the port of departure of the diminutive liners which connect France with Algeria, and for the reception of orange boats from Spain and the Balearic islands of the Mediterranean. It has no future beyond that which has already been mapped out for it.

Marseilles and its smaller sister port of Cette on the Mediterranean are practically the alpha and omega of shipping facilities of southern France—the gateways to the great manufacturing districts of Dauphiny (Grenoble) and the Lyonnais (St. Etienne, Lyons, Roanne and Creuzot) in mid-France. Cette also serves Switzerland by special favor and during the war was practically loaned to the mountain republic for the receipt and transport of foodstuffs and other necessities to this shut in country of the mountains.

Toulon with its wonderful "rade," or harbor roads, is practically unknown to commercial traffic though previous to the war 15 to 20 foreign bound ships took their departure annually, two or three among them to the United States, carrying bauxite ore to Philadelphia. The naval authorities in control of this greatest of French, greatest of Mediterranean, naval arsenals have consistently discouraged the use of the port by merchant ships. The British Orient liners to Australia did, however, just previous to the war, succeed in arriving at an accord by which they might call there, but this was granted only because of a



FIG. 10—CARGO VESSELS DOCKED IN ST. NAZAIRE HARBOR



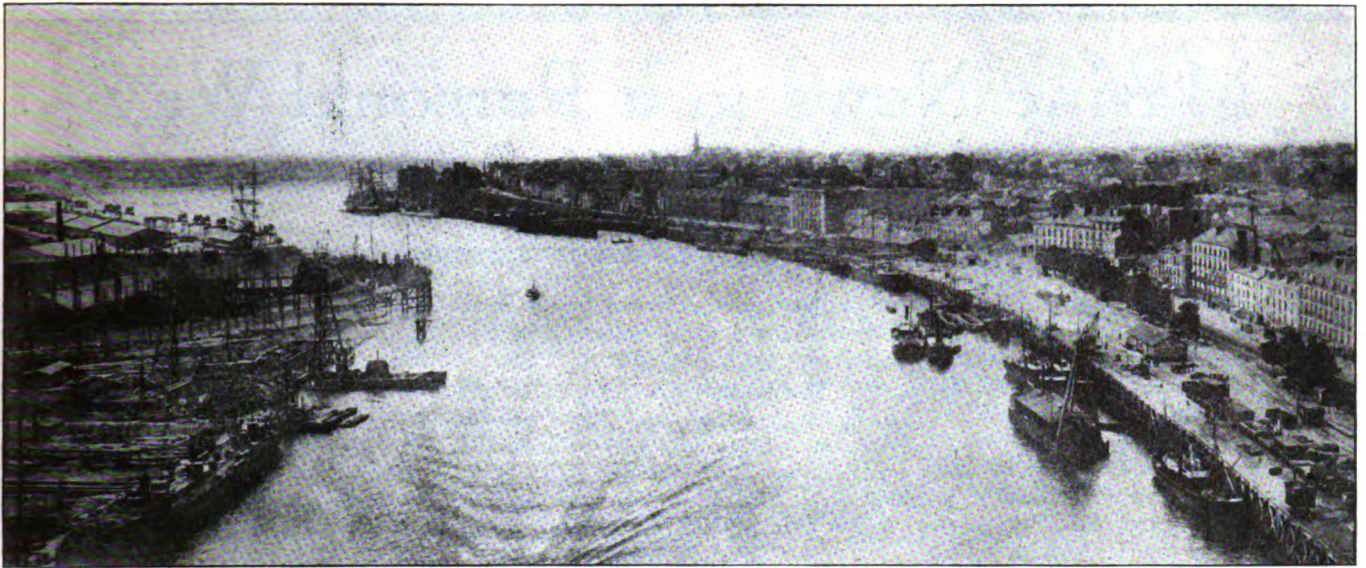


FIG. 11—LOOKING UP THE LOIRE RIVER—THE WATERFRONT OF NANTES IS ON THE RIGHT

proper lack of berthing space at Marseilles 50 or 60 miles to the westward.

East of Toulon there is but the tiny port of Cannes, used almost exclusively by yachts, of which America is generally represented by three or four of the largest afloat, and that of Nice which snuggles close under the flanks of Mont Boron, though scarcely bigger than a well spread handkerchief. The mailboats for Corsica come and go but this is about the extent of its commercial business and it is doubtful if it will ever be much greater. The great harbor of Villefranche is but an anchoring roads for warships of the great nations availing themselves of hospitality extended to them by France.

#### Definite Policy Lacking

General, centralized governmental control of French ports is not maintained. For the most part, the ports are under the tutelage of local chambers of commerce, usually working, and rather indifferently in many cases, with the government bureau des ponts et chaussées (bridges and roads), which has charge of the building and upkeep of docks and approaches. The working arrangements are further subordinated to agreements, or disagreements, with the ministry of public works. No distinct ports and harbors commission, or department, exists in France, as such, and for this reason, as much as any other, progress toward an ideal, or even a desirable, end has been slow and fragmentary.

To correspond with the new demands which are to be made, a progressive policy is urged by those in authority in France. A start has been made. Le Havre is spending 300,000,000 francs on port enlargements and inner basins are being made by excavating on a large scale while a drydock capable of taking ships approxi-

mately 1000 feet long is being constructed. Cherbourg, with its partially sheltered roadstead of a superficial area of something like five square miles, is to construct a new jetty 3300 feet long which will considerably improve landing facilities for passengers. New quays and drydocks are also projected and a vast open space will be available for warehouses and railway trackage.

Bordeaux is to develop her lower river port just inside the Verdon point, where a statue is to be erected commemorating the effort of Lafayette in the American war of independence and that of the American forces in the liberation of France. Bordeaux, Bassens and the works at Pauillac will together give the port a vast equipment in years to come. Their present equipment, including that left by the American forces, is of great extent and only needs unifying to make it worthy of the prominent place which is the just due of this historic port of ancient Guienne.

Marseilles is going still further and is cutting a ship tunnel through the mountain of La Nerthe to the inland lagoon, the Etang de Berre, which will give quay facilities of many miles. In addition, another project extends the Joliette and Estaque ports several miles west of the old port, which sheltered the galleys of the Phocaeans, and the Greeks in the historic past.

#### Marseilles Offers Advantages

Of all French ports that which most nearly approaches the ideal of a receiving and distributing gateway is Marseilles. This is due largely to the energies of the Marseilles chamber of commerce, the oldest institution of the kind in the world. It was this institution which in

In default of a standardized national policy, this is the best example of progressiveness that France has to offer on behalf of bringing her ports up to the status required by the great parts which they are to play in the future prosperity of the country.



FIG. 12—PORT OF NICE WHICH BACKS UP AGAINST A MOUNTAIN



# Marine News in a Personal Way

Intimate Gossip About What Leaders in the  
Maritime World Are Doing

**R**OY M. WOLVIN, who was recently elected president of the Dominion Steel Corp., has been connected with lake shipping for many years. He was born in St. Clair, Mich., in 1880. He entered the employ of the Western Transit Co., Duluth in 1896 and later was made general manager of the Great Lakes & St. Lawrence Transportation Co. and the Standard Steamship Co. He occupied these positions until 1910. Later he was elected president of the Standard Shipping Co., Winnipeg, Man., the Duluth Shipping Co. and the Central Shipping Co., Chicago. Afterward he became president of the Montreal Transportation Co., Ltd., Montreal, vice president and managing director of the Halifax Shipyards, Ltd., Halifax, N. S., vice president of the Collingwood Shipbuilding Co., Ltd., president of the Reid Towing Co., Sarnia, Ont., as well as occupying many other responsible positions. He has been intimately associated with transportation developments and worked in close contact with J. W. Norcross of the Canada Steamship lines. He was appointed a director of the Dominion Steel Corp. in 1919.

J. F. ANDREWS has been appointed traffic manager of the division of operations, United States shipping board, with headquarters at 45 Broadway, New York. He will have supervision over all trade districts. WALTER MORRIS, formerly assistant traffic manager of the American-Hawaiian Steamship Co., and later connected with the American Steel Export Co., has been made assistant traffic manager.

CHARLES BELKNAP, formerly director of naval transportation in the war zone, recently was elected president of the General Steamship Co. CAPT. H. H. BIRKHOLM, former assistant representative of the San Francisco board of marine underwriters in the Seattle district has been appointed Puget sound manager of the company and R. S. SILVA has been made traffic manager.

L. W. BAKER, formerly commercial agent for Alaska with the Pacific Steamship Co., has been transferred to the foreign department of the same company. He will have charge of part of the freight booking office. Mr. Bak-

er has been in the service of the company for the past five years.

H. MATHENIUS has become freight traffic manager of the New York & Argentine Steamship Co., with headquarters at 50 Broadway, New York. Formerly Mr. Mathenius was foreign freight agent of the Clyde-Mallory lines.

W. H. LUNDIN has been appointed assistant city passenger and ticket agent of the Alaska Steamship Co. in Seattle. He succeeds H. A. LAWRENCE, who recently resigned.

L. A. MASON, naval architect with J. F. Duthie & Co., Seattle, has retired on account of ill health. He has been



ROY M. WOLVIN

connected with the company since its establishment of the East Waterway plant in 1916.

HARRY AMES, formerly with C. B. Richard & Co., has been appointed traffic manager of the United States Forwarding Co., with headquarters at 55 Broadway, New York.

H. R. ELLIOTT has been appointed assistant port captain of the Nippon Yusen Kaisha with headquarters at the Great Northern dock, Seattle. Mr. Elliott

is an old time steamship man of Seattle, having been connected with maritime affairs since the Klondyke gold rush in 1898 at which time he was special agent in the north for the Alaska Steamship Co.

A. A. MUNRO, formerly with the chartering department of John S. Emery & Co., and W. H. Randall & Co., Boston, has become associated in the same capacity with Livermore, Dearborn & Co., Ltd., New York.

E. E. LOWRANCE has been elected vice president of the United States Transport Co., New York. Until recently he was active in the affairs of Lowrance & Co., steamship agents and brokers, Boston and Providence, R. I.

MAX KALISH, for many years vice president and general manager and one of the owners of the Humboldt Steamship Co., Seattle, has retired from active participation in steamship affairs.

F. M. BARRY recently resigned as assistant general manager of the Pacific Steamship Co., with headquarters in San Francisco. He is succeeded by HARRY STRUTHERS, who has acted as general manager in addition to his duties as president of the company. Mr. Struthers has also taken up the duties of vice president of the Green Star line. Mr. Barry is now general manager of Struthers & Dixon, managers and operators of Green Star line vessels.

THOMAS J. PIZZOTTI has been made assistant marine manager of the western district for the Diamond Power Specialty Co., Detroit. Mr. Pizzotti is well known in Pacific coast marine circles being a native of California. His headquarters are at 819 Monadnock building, San Francisco.

RAY T. MIDDLETON has resigned as general sales manager of the Standard Steel Castings Co., Cleveland, to become vice president and director of sales and advertising of the Kelly Metals Co., Detroit and Los Angeles, Cal. His headquarters are in Chicago where the company will establish its main manufacturing plant in the near future.

# Marine News in a Personal Way

Intimate Gossip About What Leaders in the  
Maritime World Are Doing

**J**AMES CARY EVANS was re-elected president of the Great Lakes Transit Corp. at its recent annual meeting held in Buffalo. Other officers re-elected are: Chairman of the board, W. J. CONNERS; first vice president, W. J. CONNERS JR.; second vice president, MARVIN M. MARCUS; vice president and general manager, LEVY MAYER; vice president in charge of maintenance, JOHN E. DEASY; auditor, W. R. EVANS; secretary and treasurer, L. D. GRANT. G. A. TOMLINSON and WILLIAM A. PRIME were re-elected members of the board of directors.

\* \* \*

J. J. PIPPA has joined the staff of Livermore, Dearborn & Co., where he is connected with the traffic department. Formerly Mr. Pippa was Atlantic port manager of the Transcontinental Freight Co.

\* \* \*

R. W. WEBSTER, of the Pacific Commercial Co., has returned from a tour of the company's agencies in the Far East.

\* \* \*

H. W. MCKELLAN, formerly assistant to J. F. Andrews in the office of the assistant director of the division of operations, United States shipping board, New York, has joined the traffic department of the Oriental Navigation Co.

\* \* \*

WALTER LAMBERT, naval architect and marine surveyor, has returned from an extensive business trip to Europe. Mr. Lambert's office is in Montreal.

\* \* \*

JAMES FRENCH, chief of Lloyd's Registers of Shipping in the United States and Canada, is making a 3-months' tour of the Orient with the object of making an exhaustive study of shipping conditions in China and Japan.

\* \* \*

M. J. LOORAN has become head of the chartering department of the Equity Steamship Co., New York. Formerly he was connected with the homeward cargo department, United States shipping board.

\* \* \*

HAROLD BURCHARD has arrived at Hongkong to assume charge of the office at that port of Frank Waterhouse & Co., Seattle ship operators. Mr. Bur-

chard, who returned from service in France last year, is a son of D. W. Burchard, in charge of the operating department of the shipping board for the north Pacific.

\* \* \*

DR. ALBERT C. BONASCHI recently was appointed by the College of the City of New York as lecturer for the merchant marine administration and operation course.

\* \* \*

H. K. DAWSON has assumed his new duties as general manager of the Columbia Pacific Shipping Co., Portland, Oreg. Mr. Dawson, who was formerly with Sudden & Christensen, San Francisco, succeeds A. C. STUBBES.

\* \* \*

CAPT. E. L. MCNOBLE has been named port captain at Seattle for the Pacific Steamship Co. after acting in that capacity for a long time, reporting to Capt. A. J. Storrs, port superintendent. E. H. HALL, formerly auditor for the company at Tacoma, Wash., has been transferred to the Seattle office and promoted to the position of comptroller.

\* \* \*

E. T. STANNARD, general manager of the Kennecott Copper Corp., will succeed R. W. BAXTER, who has resigned as vice president and general manager of the Alaska Steamship Co. and allied corporations.

\* \* \*

H. A. LAWRENCE, Seattle passenger agent for the Alaska Steamship Co., has resigned to return to the Oregon-Washington railroad with which company he was formerly city ticket agent. He has been succeeded by H. A. LUDIN.

\* \* \*

PAUL UMOFF, formerly an officer in the Russian army, has joined the staff of the Thorndyke-Tremholme Co., Seattle, shipping agent. His department will keep in touch with trade conditions in foreign markets with the idea of extending the company's connections.

\* \* \*

CHARLES R. MELVILLE, EDWARD H. MARSH, CHARLES N. WEIS and FRED P. ZOLLINGER, all of Sandusky, O., and GUY H. MCFALL, Detroit, were re-elected directors of the Sandusky & Islands Steamboat Co., at its recent annual meeting held in Sandusky. The directors

re-elected the following officers: Charles K. Melville, president; Charles N. Weis, secretary and general manager; and Fred P. Zollinger, treasurer.

\* \* \*

CARLOS F. DE BERNA is now connected with the Rolph Mail Steamship Co., San Francisco, in the capacity of manager of the Latin American department.

\* \* \*

E. P. ROBINSON was elected president of the New England Dry Dock and Ship Repair association at its recent annual meeting. Other officers elected are: W. R. EVANS JR., vice president; CAPT. H. J. COOK, treasurer. H. F. LALLEY was elected a member of the executive committee to serve out the unexpired term of FRANK G. CROWLEY, who died recently. JENS BERTELSEN was elected to the executive committee.

\* \* \*

CAPT. L. G. WALLACE has been named as port engineer and CAPT. JULIAN F. HUMPHREY port captain for the Sigsbee-Humphrey Pacific Co., which is planning a steamship service between Tacoma, Wash., and the Orient direct.

\* \* \*

JAMES G. MCCARTY has been appointed manager of the Canadian branch, Metal & Thermit Corp., New York. Mr. McCarty's headquarters are in Toronto. ROBERT L. BROWNE has been transferred from the company's New York office to its Boston office where he will have charge of sales in the New England states.

\* \* \*

FRED M. HARMON has resigned as fleet engineer of the Wilson Transit Co. He has been connected with the Wilson line for 27 years and is well known all over the lakes. He is now associated with the Bennett Harmon Engineering Co., New York.

\* \* \*

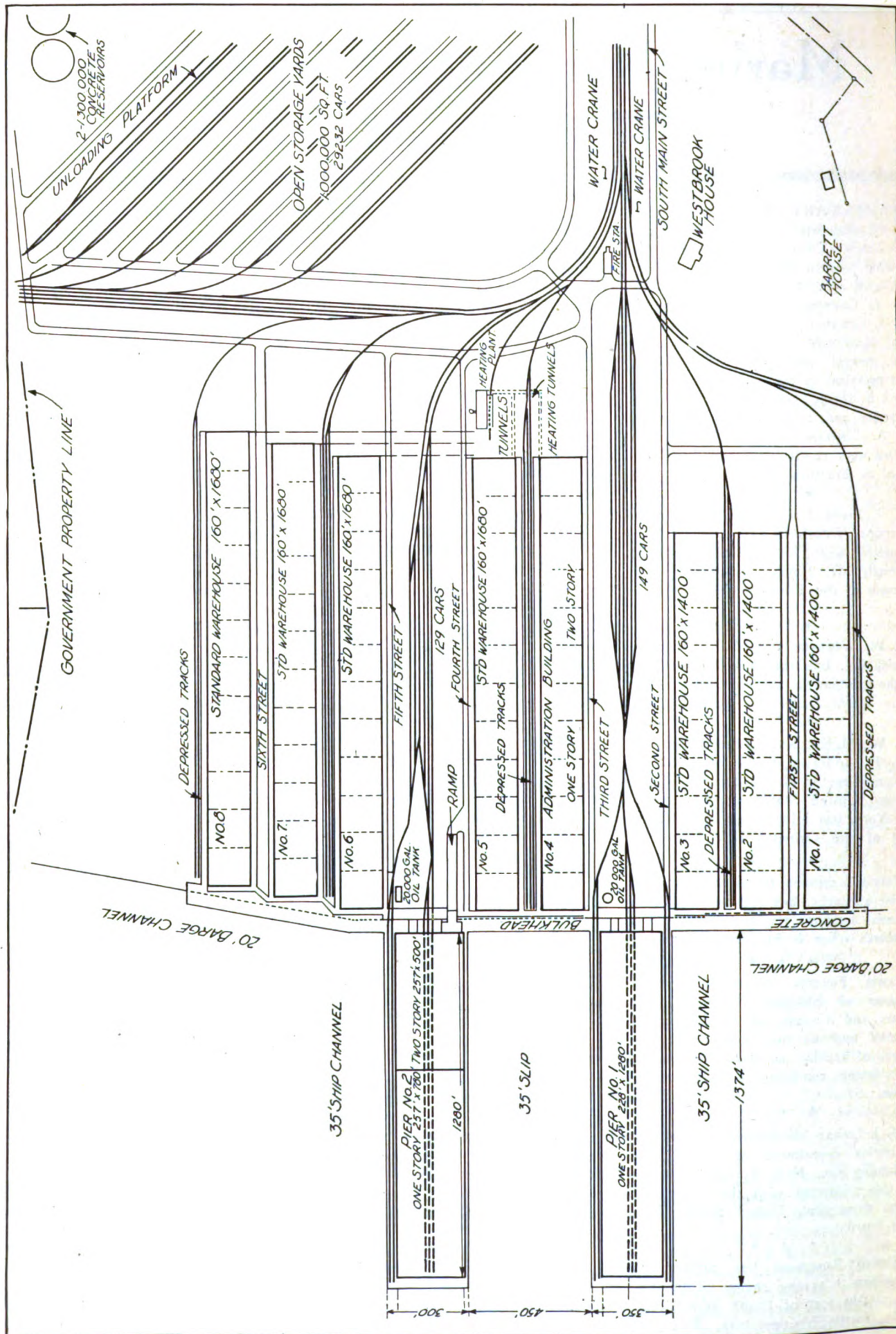
MARCUS GROSSMAN, formerly connected with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed chief metallurgist of the Electric Alloy Steel Co.

\* \* \*

CAPT. HAROLD K. HINES, United States navy, retired, who was assistant counsel with the shipping board, New York, has become a member of the firm of Brown, Cooksey & Hines, New York. Captain Hines has charge of the firm's admiralty and shipping departments.



Base Aids

Army Supply T  
Contains 45 M

GENERAL PLAN OF THE ARMY SUPPLY BASE, NORFOLK, VA. BUILT AT A COST OF APPROXIMATELY \$29,000,000 THIS INSTALLATION COVERS 912 ACRES OF GROUND

DEMAND for more extensive modern terminal facilities at Hampton roads had been in some time before the construction of a supply base at West bluffs had been decided by the city of Norfolk, and some preliminary work upon the entry of the war, however, was apparent that the district must become a permanent supply center for the army and that the existing facilities at Norfolk, Va., would be in excess of those required. When the war department decided the construction of the base, the plans somewhat, and the city of Norfolk was required to provide additional land and to carry the project through to completion as possible. The Norfolk army supply base covers a total of 912 acres of land, and the West bluffs, about one mile from the point on the lower Elizabeth river near Norfolk, was actually begun in 1918, although the work was turned over to the army for completion until the project necessitated the expenditure of \$28,926,181.72, which represented the cost of the base. The general contract for the principal structures was awarded to the two piers, with the warehouses, an extensive general storage yard, and the loading and dispatching facilities. The base is designed to accommodate 1,000,000 cubic feet of active water in the 2500 feet. The base is located so as to be equidistant from the existing warehouses. Each pier is giving an area of 702,000 square feet of 5312 line of water from the ship channel from a mean low water level of 35 feet, to the ship between the piers. A 350-foot pier No. 1

# Base Aids Norfolk's Commerce

**Army Supply Terminal Costing Nearly \$29,000,000 Covers 912 Acres and Contains 45 Miles of Tracks Which Accommodate 4800 Freight Cars**

**D**EMAND for more extensive and modern terminal facilities at Hampton roads had become so acute for some time before the war that the construction of a suitable terminal at Bush bluffs had been decided upon by the city of Norfolk, plans prepared and some preliminary work started. Upon the entry of the United States into the war, however, it became at once apparent that the Hampton roads district must become a strategically important supply center in military operations and that the requirements for shipping facilities at Norfolk and Newport News, Va., would soon be greatly in excess of those available. Arrangements were made, therefore, under which the war department took over the construction of the terminal already initiated by the city of Norfolk, amplified the plans somewhat, bought 600 acres of additional land and rushed the entire project through to completion as quickly as possible. The result is the Norfolk army supply base which covers a total of 912 acres of ground at Bush bluffs, about one mile south of Sewall's point on the lower harbor of the Elizabeth river near Norfolk, Va.

Construction was actually commenced in January, 1918, although the terminal was not turned over to the transportation service of the army for operation as entirely completed until July, 1919. The entire project necessitated an expenditure of \$28,926,181.72, of which \$26,613,078.87 represented cost of construction. The general contractors were Porter Bros.

The principal structures of the terminal are two piers, with pier sheds, eight warehouses, an extensive open car and general storage yard, twin car classification yards and a primary car receiving and dispatching yard.

## Can Accommodate Large Vessels

The active water frontage of the base is 2500 feet. The piers are 450 feet apart and so located as to be practically equidistant from any of the eight warehouses. Each pier is 300 x 1328 feet, giving an aggregate floor area of 792,000 square feet, and a berthing space of 5312 lineal feet. The approaching channel from the Elizabeth river has a mean low water drawing depth of 35 feet, to which depth the 450-foot slip between piers has been dredged. A 350-foot dock on the south side of pier No. 1 and on the north

side of pier No. 2, provides for handling all normal sized freight and passenger vessels at the terminal. Four large oceangoing steamers have already been docked simultaneously on one side of pier No. 2. The entire pier berthing space makes possible the handling of 12 average size vessels at one time, a total of 90,000 deadweight tonnage.

In addition to the piers proper, a 300-foot barge channel is provided on the north and south extremities of the concrete bulkhead which extends the entire width of the terminal proper, permitting the docking of smaller vessels, barges, etc., over an effective distance of 1800 lineal feet along the quay.

## Provides Modern Equipment

Pier sheds of structural steel and reinforced concrete construction, with modern mechanical equipment are provided on each pier. The shed on pier No. 1 is single story, while part of the shed on pier No. 2 is two stories, the latter being arranged for administrative uses. The basic dimensions of each pier structure are 257 x 1280 feet, all designed for a live load capacity of 800 pounds per square foot. The total working floor area of the pier superstructures is 631,000 square feet. A continuous elevated girder for carrying hoisting tackle skirts the entire dock sides of both pier sheds. The arrangement and design of the sheds conform to the most approved marine engineering practice. Sufficient area is provided opposite each berth to approximately shelter the contents of the vessel berthed there.

The eight warehouses provided for semipermanent storage of materials moving in either direction through the terminal, are of identical size. They are of frame timber construction with brick fire walls, tile exterior walls and stucco finish. The gross floor area of the eight warehouses is over 2,000,000 square feet, each building being one story and approximately 160 feet long x 1600 feet wide. It is interesting to note that the total floor area of other storage warehouses in connection with private terminal facilities at the port of Norfolk equals but 1,365,320 square feet.

Railroad connections to the Norfolk base are provided by two direct lines of the Norfolk & Portsmouth Belt Line railroad, which road is co-operatively owned by the eight trunk line systems

entering Norfolk, and over which the facilities of each are extended to the base at flat Norfolk rates. The railroad trackage within the property is about 45 miles in extent with a capacity for 4800 cars, admirably adapted to meet all rail transportation requirements of merchandise moving in and through the terminal.

A primary receiving yard has been constructed about two miles back of the terminal, where switching facilities are provided for the initial classification of inbound freight cars. This is immediately followed by an outbound classification yard where complete freight trains may be assembled for dispatch to various inland points. A larger classification yard of 528-car capacity is next provided for the general classification of outbound freight trains and individual cars.

Immediately following the main classification yard is an extensive open storage yard containing 1,000,000 square feet of unsheltered area for the temporary storage of both loaded and unloaded freight cars and for heavy impervious materials. This open storage area is intersected by six double track railroad lines, providing a large car storage capacity.

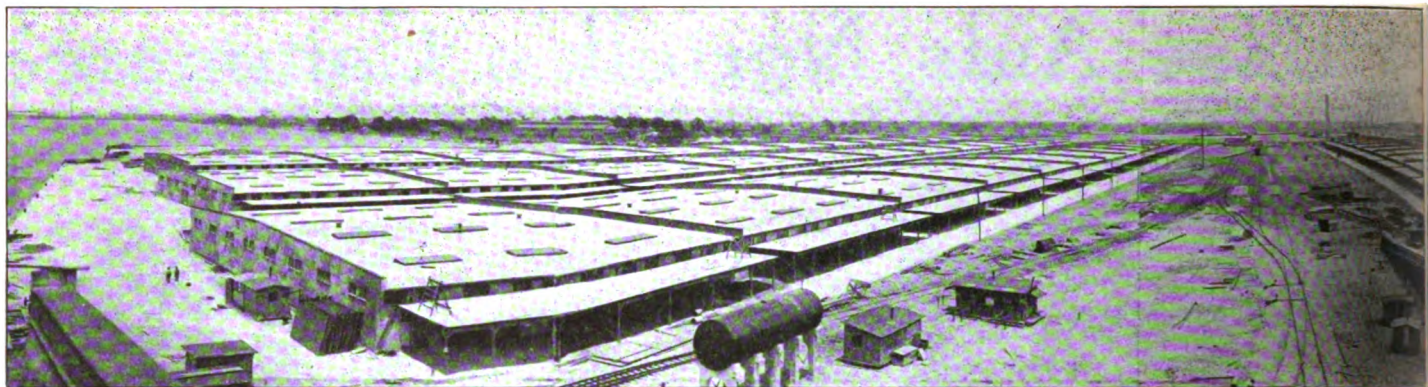
The trackage system supporting the warehouses consists of triple tracks between all buildings, depressed so as to permit the transfer of freight from car floors to warehouse platforms at an even level. One track is directly alongside each warehouse platform.

## How Shipments Are Expedited

Double railroad trackage extends the entire length of both sides of pier No. 1 and the north side of pier No. 2. The trackage approaches to the piers are supported by minor classification yards between warehouses, having average capacities of 135 cars. Rail facilities are thus provided for spotting cars directly alongside of ships, and for the free movement of rail cranes. Electricity for light and power is furnished the plant by the Virginia Railway & Power Co., Norfolk, Va.

The terminal is equipped with three locomotive cranes, two cargo masts, and an ample number of tractors and trailer trucks for meeting all uses to which the plant has been subjected. Sufficient hand trucks have been provided to permit the movement of general merchandise over small distances up to 200





PANORAMIC VIEW OF THE ARMY SUPPLY BASE BUILT AT NORFOLK AS A WAR EMERGENCY—CONSTRUCTION WAS STARTED IN JANUARY

feet. Automatic trucks and trackless trains are utilized exclusively for longer indoor hauls.

The commercial activities of Hampton roads have been such as to most urgently require the earliest and fullest possible commercial utilization of the facilities of the Norfolk army terminal. During the war, the army had, however, been leasing pier and terminal facilities at Lambert's point and to a considerable extent at Newport News. Upon the completion of the Norfolk base, extensive military marine operations still

remained to be performed in connection with the demobilization of the army, so the army released the private pier facilities which it had been using at Hampton roads and concentrated its remaining activities in the supply base. It was thus possible to transfer the entire Newport News army port of embarkation to Norfolk early in September, 1919, as well as considerable naval activities.

#### Prepare for Private Use

The following December, when military operations had slackened materially,

it became possible for the war department to relinquish part of the terminal. Pier No. 1 was accordingly leased to the city of Norfolk for a period of five years. Since that time and up to the first of March, 41 commercial ships with import and export cargoes of 43,500 tons have been handled through the Norfolk terminal.

In rail traffic there has been handled to date approximately 50,000 freight cars, or over 1,500,000 tons of both government and private materials in and out of the terminal.

The complete capacity of the plant may be most properly gaged by primarily considering the number of vessels and their tonnage which may be handled. The available berthing area for ocean-going steamers makes possible, assuming a minimum stay of 12 days per berth, the handling of 360 first class ships. Assuming further an 80 per cent utilization of this total deadweight tonnage in both import and export service, the berthing facilities are equivalent to a capacity of 4,320,000 tons per year.

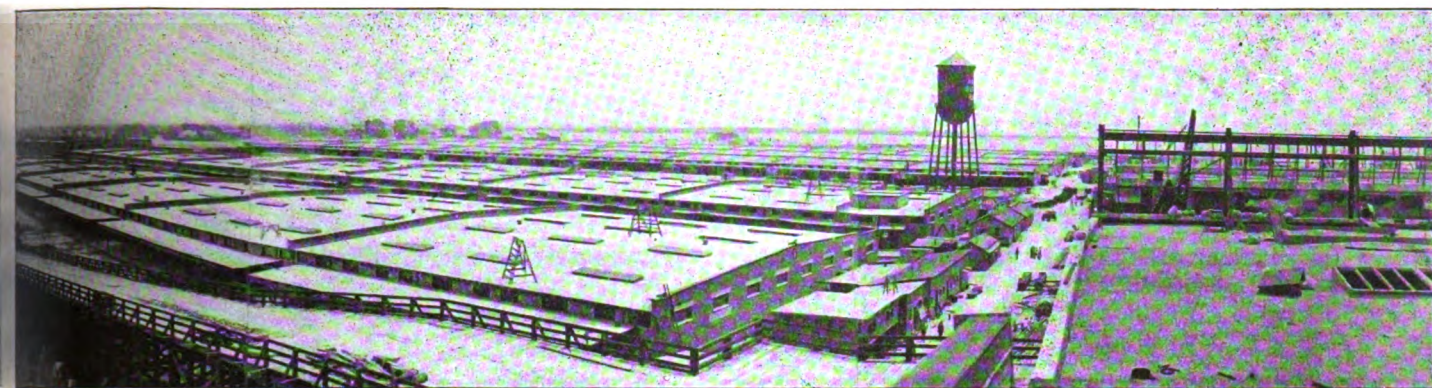
The mechanical material handling apparatus of the terminal has a present aggregate capacity for handling 10,000 tons per day, which may be doubled as occasion demands, with the installation of additional equipment for which adequate space is available. The storage facilities of the warehouses and pier sheds are also ample for all normal storage and warehouse requirements of a traffic of this size, the total storage capacity of the terminal being 918,700 tons. In fact, the warehouses might even be utilized to a considerable extent in free port activities and still provide sufficient space for necessary storage purposes.

Although the best coal handling equipment in the United States, as well as a large capacity grain elevator is located at Newport News, Norfolk proper has always lacked modern terminal facilities particularly adapted for efficiently handling general merchandise, a situation which has now been slightly alleviated by the partial commercial



UPPER ILLUSTRATION SHOWS THE TRACKAGE INSTALLED BETWEEN ALL WAREHOUSES—CENTER VIEW DISCLOSES PART OF THE CLASSIFICATION YARD WHILE THE LOWER VIEW SHOWS ONE OF THE PIERS AS SEEN FROM THE WATERFRONT





1918, AND THE BASE COMPLETED IN JULY, 1919—THIS BASE WILL AID MATERIALLY IN DEVELOPING THE COMMERCE OF HAMPTON ROADS

utilization of the army Norfolk base.

During the prewar period of 1913-14, which might be considered the latest normal year of shipping operations, the Hampton roads district negotiated foreign trade clearances equivalent to 4.2 per cent of those of all national customs district. During 1914, the average monthly clearances were 54 vessels, although this figure was naturally swelled materially during subsequent years as a result of the abnormal conditions brought about by the war. During 1919, however, the monthly clearances from the Hampton roads district averaged close to 100 vessels. The future demand for adequate ship terminal facilities at Norfolk and Newport News seems certain to steadily increase.

As soon as the needs of the war department and other governmental bureaus have decreased sufficiently, part of the remaining pier at the Norfolk terminal will also be leased for commercial operation, together with such portions of the warehouses as may be available, although the title to the property itself will remain permanently vested in the government and the jurisdiction over its operation administered by the war department.

## Sea Opportunities

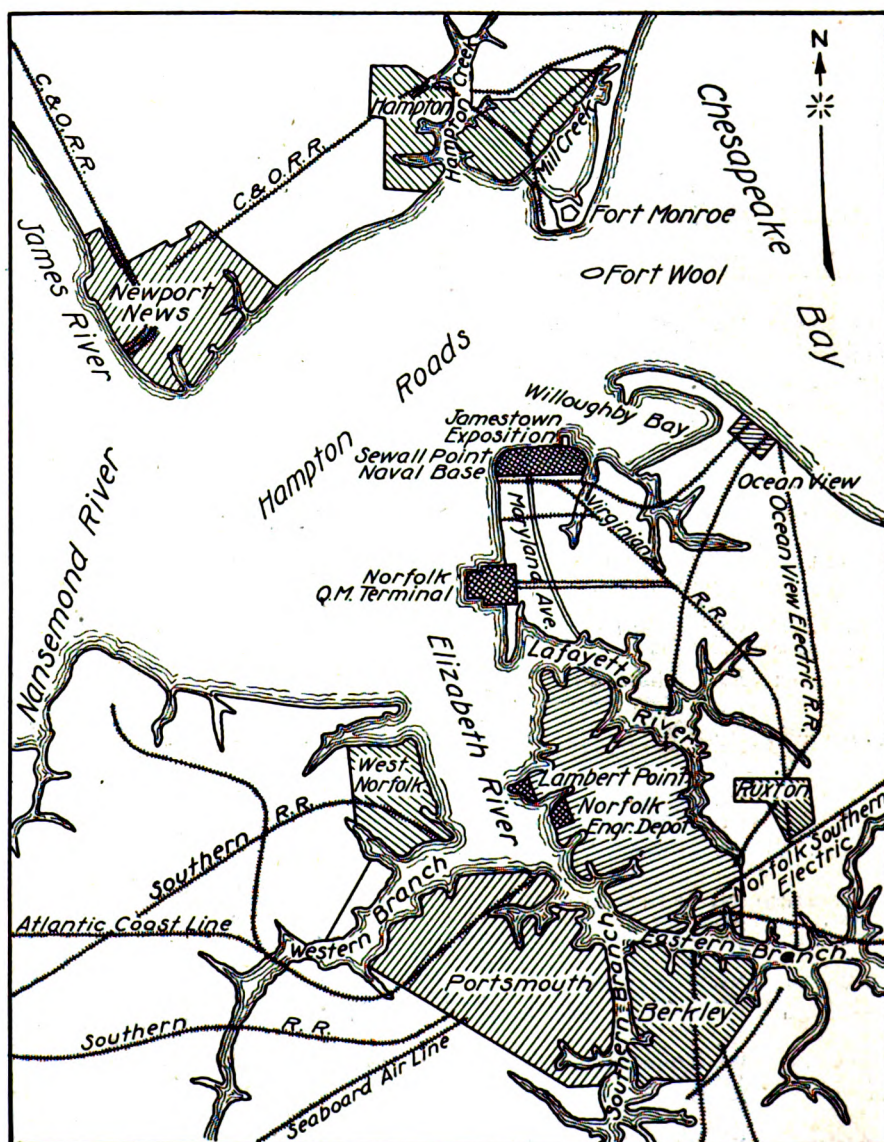
(Concluded from Page 279)

They are excellent. Not every man that ships aboard a vessel will become a chief engineer or a master, just as every man who works ashore has no chance of becoming a foreman or superintendent. The chances for promotion at sea, however, are excellent and are worth the consideration of any young man with a bent toward the water.

One distinct advantage in following the sea is that the young man has an unlimited opportunity of visiting foreign countries. The desire to travel is strong in most human beings but as traveling is a rich man's luxury, comparatively few have ever been a thousand miles from their birthplaces.

Who has not read of the mysteries of foreign climes without experiencing a desire to visit them! The wonderful northern lights of high latitudes, the dusky inhabitants of coral islands in the South seas, the Orient with its ancient customs, queer ports in out of the way places, all have an appeal that is unblunted by familiarity. The

average man gains knowledge of these from the printed page only; he is a sort of parlor traveler. The man at sea, however, gains his knowledge of far away places first hand. He sees with his own eyes in the vivid colors of nature the actual scenes which dry land sailors can comprehend only from inadequately drawn word pictures.



MAP OF NORFOLK AND VICINITY SHOWING LOCATION OF ARMY SUPPLY BASE



# Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties—  
A Record of Collisions, Wrecks, Fires and Losses

| Name of vessel      | Date    | Nature              | Place            | Damage resulting    | Name of vessel    | Date    | Nature                | Place           | Damage resulting   |
|---------------------|---------|---------------------|------------------|---------------------|-------------------|---------|-----------------------|-----------------|--------------------|
| Afalkey             | Mar. 14 | Disabled            | At sea           | Broke steering gear | Lake Felden       | Mar. 15 | Grounded              | Bahamas         | Not stated         |
| Albany              | Mar. 14 | Collision           | Port Townsend    | Damaged gear        | Lake Fauquier     | Mar. 6  | Grounded              | Port Tampa      | Slight             |
| Admiral Mayo        | Mar. 6  | Engine trouble      | At sea           | Slight              | Lake Fraley       | Mar. 9  | Damaged boilers       | At sea          | Slight             |
| Augusta W. Snow     | Mar. 15 | Lost deck load      | At sea           | Not stated          | Lake Girardeau    | Mar. 5  | Broke rudder          | At sea          | Slight             |
| Albatross           | Mar. 11 | Grounded            | Egg Island       | Not stated          | Lake Stobli       | Mar. 3  | Engine trouble        | At sea          | Slight             |
| Angelo Tosi         | Mar. 13 | Broke rudder        | At sea           | Slight              | Lake Washburn     | Mar. 5  | Collision             | Sewalls Point   | Slight             |
| Ariana              | Mar. 14 | Sprung leak         | At sea           | Slight              | Lal Lal           | Mar. 14 | Sank                  | At sea          | Total loss         |
| America             | Mar. 6  | Strike              | At Genoa         | Detained            | Lilia Boutiller   | Mar. 2  | Grounded              | Trepassey Bay   | Heavy              |
| Admiral Drake       | Mar. 10 | Sprung leak         | At sea           | Not stated          | Lilly G. Wells    | Mar. 12 | Sank                  | Baltimore       | Not stated         |
| Alfonso             | Mar. 15 | Afire               | Port Manila      | Total loss          | Louisville Bridge | Mar. 5  | Afire                 | Thames river    | Damaged cargo      |
| Braddock            | Mar. 18 | Grounded            | Carlshamm        | None                | Milwaukee Bridge  | Mar. 14 | Engine trouble        | At sea          | Slight             |
| Balabac             | Mar. 12 | Afire               | Port of Spain    | Total loss          | Mystery           | Mar. 18 | Grounded              | St. Johns river | Not stated         |
| Brookfield          | Mar. 3  | Afire               | At sea           | Total loss          | Mohawk            | Mar. 17 | D.sabled              | At sea          | Not stated         |
| Buttonwood          | Mar. 3  | Grounded            | Kaiser canal     | Slight              | Mask nong         | Mar. 4  | Sprung leak           | At sea          | Slight             |
| Baldan              | Mar. 3  | Boilers burnt out   | At sea           | Heavy               | M.nooka           | Mar. 19 | Lost propeller        | English channel | Not stated         |
| Benjamin Wallace    | Mar. 17 | Lost deck gear      | At sea           | Not stated          | Mark H. Gray      | Mar. 20 | Heavy weather         | At sea          | Jettisoned cargo   |
| Buyo Maru           | Mar. 15 | Grounded            | Off Watts Island | Not stated          | Minnewawa         | Mar. 1  | Broke steering gear   | At sea          | Slight             |
| Buckhannon          | Mar. 10 | Damaged boilers     | At sea           | Slight              | M.skinouge        | Mar. 3  | Tanks leaking         | At sea          | Not stated         |
| Bushrod             | Mar. 18 | Bunkers afire       | At sea           | Not stated          | Marne             | Mar. 9  | Explosion             | Cristobal       | Heavy              |
| Beryl               | Mar. 3  | In distress         | At sea           | Not stated          | Matowoc           | Mar. 11 | Sprung leak           | At sea          | Heavy              |
| Corsican            | Mar. 5  | Engine trouble      | At sea           | Not stated          | Ma.d of La Harve  | Mar. 9  | Abandoned             | At sea          | Total loss         |
| Commonwealth        | Mar. 15 | Collision           | Off Boston       | Damaged gear        | Montara           | Mar. 9  | Machy. trouble        | At sea          | Slight             |
| Courageous          | Mar. 15 | Collision           | Bos.on           | Damaged plates      | Mopang            | Mar. 11 | Broke steering gear   | At sea          | Not stated         |
| Camaguey            | Mar. 2  | Afire               | Brooklyn         | Heavy               | Maurepas          | Mar. 3  | Hit obstruction       | At sea          | Damaged bilge keel |
| Chester Valley      | Mar. 11 | Machy. trouble      | At sea           | Broke pumps         | Moosehaulic       | Mar. 3  | Hit obstruction       | At sea          | Broke propeller    |
| Caserta             | Mar. 1  | Grounded            | Palermo          | Heavy               | Morristown        | Mar. 5  | In d stress           | At sea          | Not stated         |
| Cocaponset          | Mar. 14 | Afire               | At sea           | Heavy               | Marsodak          | Mar. 5  | Grounded              | Off Delaware    | Not stated         |
| Chauteauqua         | Mar. 12 | Grounded            | Off Bermuda      | Heavy               | Monomac           | Mar. 13 | Engine trouble        | At sea          | Not stated         |
| City of Berkeley    | Mar. 11 | Grounded            | Hog Island       | Slight              | Navaio            | Mar. 8  | Heavy weather         | At sea          | Not stated         |
| Connorsville        | Mar. 9  | Heavy weather       | At sea           | Smashed fittings    | Natenna           | Mar. 9  | Stern tube leaking    | At sea          | Slight             |
| Charlot             | Mar. 1  | Sprung leak         | At sea           | Damaged cargo       | Nacoochee         | Mar. 16 | Strike                | Savannah        | Detained           |
| Cowan               | Mar. 14 | Engine trouble      | At sea           | Slight              | Northern No. 14   | Mar. 6  | Sunk                  | Off Barnegat    | Not stated         |
| City of Alma        | Mar. 6  | Grounded            | Philadelphia     | Slight              | Okesa             | Mar. 19 | Broke steering gear   | At sea          | Slight             |
| Canadian Warrior    | Mar. 6  | Engine trouble      | At sea           | Not stated          | Olockson          | Mar. 13 | Afire                 | Off Cape Mala   | Not stated         |
| Cubadist            | Mar. 4  | Disappeared         | At sea           | Not known           | Ocinoco           | Mar. 16 | Heavy weather         | At sea          | Sprung masts       |
| Cape Breton         | Mar. 8  | Grounded            | Scatari Island   | Not stated          | Osterdal          | Mar. 12 | Crew's quarters afire | Brooklyn        | Not heavy          |
| Devona              | Mar. 14 | Broke steering gear | At sea           | Slight              | Oneco             | Mar. 8  | Grounded              | Huelva bar      | Lost rudder        |
| Dirigo              | Mar. 15 | Damaged rudder      | At sea           | Slight              | Pro Patria        | Mar. 1  | Propeller trouble.    | At sea          | Lost blades        |
| Dahlia              | Mar. 17 | Machy. trouble      | At sea           | Slight              | Queen Helena      | Mar. 15 | Collision             | Boston          | Damaged fittings   |
| Deva                | Mar. 4  | Boiler trouble      | At sea           | Not stated          | Rock Island       | Mar. 4  | Grounded              | Off Crowlink    | Not stated         |
| Edith               | Mar. 1  | Machy. trouble      | At sea           | Broke steering gear | Robert G. Cann    | Mar. 14 | Grounded              | Off Canso       | Not stated         |
| Esperanza           | Mar. 11 | Grounded            | Off Progreso     | Not stated          | Red Mountain      | Mar. 5  | In distress           | At sea          | Boiler trouble     |
| Equador             | Mar. 9  | Reported missing    | At sea           | Not known           | Sagamore          | Mar. 13 | Grounded              | Bristol, R. I.  | Holed bottom       |
| Eskasoni            | Mar. 8  | Machy. trouble      | At sea           | Slight              | Snow and Burgess  | Mar. 14 | Sprung leak           | At sea          | Damaged cargo      |
| Ermemore            | Mar. 3  | Afire               | Boston           | Slight              | St. Paul          | Mar. 4  | Boiler trouble        | At sea          | Not stated         |
| Eva B. Douglass     | Mar. 8  | Foundered           | At sea           | Total loss          | Shooters Island   | Mar. 18 | Engine trouble        | Baltimore       | Slight             |
| Frederick J. Lovett | Mar. 16 | Lost sails          | At sea           | Heavy               | Sunbeam           | Mar. 18 | Afire                 | Hamburg         | Damaged chartroom  |
| Fiskjo              | Mar. 8  | Grounded            | Bergen           | Not stated          | Sinaloa           | Mar. 12 | Machy. trouble        | At sea          | Lost propeller     |
| Georgia             | Mar. 17 | Grounded            | Mobile           | Slight              | Sydneyas          | Mar. 1  | Abandoned             | At sea          | Total loss         |
| George Kirkham      | Mar. 18 | Sank                | North River      | Not stated          | Tewksbury         | Mar. 17 | Grounded              | Cape Pine       | Not stated         |
| Golaa               | Mar. 12 | Fouled anchor       | Reedy Island     | Slight              | Tancred           | Mar. 9  | Sprung leak           | At sea          | Damaged cargo      |
| Governor Russell    | Mar. 17 | Damaged guard       | Philadelphia     | Slight              | Violet Buffet     | Mar. 9  | Grounded              | Off St. John    | Heavy              |
| Governor Parr       | Mar. 9  | Dragged anchors     | Halifax          | Slight              | Viola May         | Mar. 1  | Grounded              | St. Pierre      | Heavy              |
| Glenorchy           | Mar. 3  | Grounded            | Off Brazil       | Not stated          | Western Cross     | Mar. 3  | Turbine trouble       | At sea          | Not stated         |
| George M. Reed      | Mar. 2  | Sank                | Philadelphia     | Cargo damaged       | Western Ally      | Mar. 16 | Grounded              | Cape Henry      | Slight             |
| Gullford            | Mar. 10 | Heavy weather       | At sea           | Not heavy           | Westford          | Mar. 4  | Afire                 | Harve           | Damaged cargo      |
| Huron               | Mar. 8  | Sprung leak         | At sea           | Damaged cargo       | West Himrod       | Mar. 18 | Engine trouble        | At sea          | Slight             |
| Hertha              | Mar. 16 | Sprung leak         | At sea           | Slight              | West Hephurn      | Mar. 1  | Propeller trouble     | At sea          | Lost blades        |
| H. M. Whitney       | Mar. 12 | Leaking             | At sea           | Slight              | West Inskip       | Mar. 8  | Afire                 | At sea          | Not stated         |
| Heinritlund         | Mar. 9  | Grounded            | Off Halifax      | None                | West Mohna        | Mar. 18 | Damaged propeller     | At sea          | Slight             |
| Independence Bridge | Mar. 7  | Boiler trouble      | At sea           | Not stated          | Wassaic           | Mar. 1  | Broke propeller       | At sea          | Slight             |
| Ima Hogg            | Mar. 2  | Sank                | Naches river     | Not stated          | Wabash            | Mar. 14 | Grounded              | Portland, Me.   | Total loss         |
| Indier              | Mar. 14 | Grounded            | Off Tortugas     | Not stated          | William Bowden    | Mar. 11 | Heavy weather         | At sea          | Sprung leak        |
| John Llewellyn      | Mar. 20 | Heavy weather       | At sea           | Lost gear           | Waubesa           | Mar. 14 | Boilers leaking       | At sea          | Slight             |
| J. G. Shaw          | Mar. 20 | Grounded            | Block Island     | Heavy               | Wassaic           | Mar. 4  | Hit obstruction       | At sea          | Broke propeller    |
| Jeremiah Smith      | Mar. 14 | Foundered           | At sea           | Total loss          | Yuri Maru         | Mar. 12 | Broke propeller       | At sea          | Not stated         |
| Kootenai            | Mar. 17 | Engine trouble      | At sea           | Disabled            | Yurgai            | Mar. 14 | Foundered             | At sea          | Total loss         |
| Kosmos              | Mar. 8  | Grounded            | Stavanger        | Not stated          | Zuiderdijk        | Mar. 8  | Out of coal           | At sea          | None               |
| Kerkenaa            | Mar. 17 | Machy. trouble      | At sea           | Slight              |                   |         |                       |                 |                    |
| Lake Dabery         | Mar. 4  | Afire               | At sea           | Damaged cargo       |                   |         |                       |                 |                    |
| Lake Ellithorpe     | Mar. 9  | Broke propeller     | At sea           | Slight              |                   |         |                       |                 |                    |
| Lake Flynnus        | Mar. 4  | Auxiliary trouble   | At sea           | Slight              |                   |         |                       |                 |                    |

# Activities in the Marine Field

Latest News From Ships and Shipyards

## Ore and Coal Exchange To Continue

BY CAPTAIN MARTINGALE

**R**AILROADS interested in the lake coal and ore trade recently announced that they will continue the Ore and Coal exchange with the object of expediting the movement of coal shipments, providing cars for the ore movement and aiding transportation. The exchange is to be operated on the same basis as was followed during the season of 1919 in aiding freight shipments and providing cars and no change will be made in the organization. The consensus of opinion is that there will be a car shortage at the lower end of the route and for this reason vesselmen and ore and coal shippers are in favor of having the exchange continue to function. Tonnage is not coming out in the ore trade although business is reported brisk. Present indications are that there will be much more season chartering done.

Ice in Lake Erie is breaking up fast, according to Louis Lautenslager, manager of the Great Lakes Towing Co. at Buffalo. Recently Mr. Lautenslager went out in the tug *GEORGIA* to test ice conditions and found at a distance of 10 miles from Buffalo harbor that the ice was soft and breaking up fast. The tug had no trouble in getting through the ice. Navigation is expected to open in the near future.

The steamer *PRICE MCKINNEY*, the only boat to hold winter storage grain at Buffalo, has discharged at the Frontier elevator. Many of the boats at Buffalo have their engineers aboard and are ready to go into commission as soon as the ice clears. Several of the vessels at Buffalo have taken on coal. Licensed men for all the bulk freighters have been signed on for the season and not many changes were made in the lineup of the officers of the vessels that will move ore, coal and grain. A few of the older captains and chief engineers resigned but the majority of the men are still on the job. Some shifting was done in a large number of the vessels of various fleets and many engineers and officers were promoted.

The carferry steamer *ANN ARBOR* No. 4, which hit a boulder outside Manitowoc harbor recently, was placed in drydock at Manitowoc for repairs. It is understood that the damage sustained was not serious.

The tug *CONSTITUTION*, owned by the Reid Wrecking Co., Sarnia, Ont., sank recently at the Sarnia saw mills dock where she was wintering. The vessel

went down in 18 feet of water. It is believed that the heavy ice that formed around the craft pulled the caulking from her seams which caused her to leak during mild weather. She will be floated as soon as the ice permits wrecking operations to be undertaken.

The barge *GEORGE B. OWEN* is undergoing repairs at the Wolverine drydock, Port Huron.

Service over the D. & C. line was opened April 1, with the departure of the *EASTERN STATES* and the *DETROIT II* from Buffalo. One vessel made the day trip followed by the other on the night trip.

Capt. William H. Gatfield, 75, for many years a member of the firm of Duff & Gatfield, marine reporters and vessel owners, Sandwich, Ont., died at his home near Amherstburg, March 25. Captain Gatfield was well known in Great Lakes shipping circles and retired from active business eight years ago. He is survived by his widow, one daughter and five sons.

The Canadian steamer *SARNIAN* was badly damaged by fire at Buffalo during the latter part of March. Work of repairing the vessel will begin at once.

The Buffalo Marine Construction Corp. has a lot of repair work on hand. The steamer *G. J. GRAMMER*, of the Becker fleet, undergoing repairs at that yard, will be ready to go into commission April 15. The steamers *SIRIUS*, *P. P. MILLER*, *SCHOONMAKER* and *NEPTUNE*, also repairing at the yard will be ready to sail when navigation opens, according to Frank Ranahan, general manager of the company making the repairs.

Officials of the Great Lakes Towing Co. announce that the wages of licensed tugmen will be the same for all ports, the contracts calling for \$2400 a year for 10 months. This is an advance over last season's rate. Firemen and linemen get an advance of \$17.50 a month making their wages \$165 a month, not found. Working conditions remain practically the same as last season's.

The following notice regarding changes in aids to navigation in Superior bay to be made effective at the opening of navigation were announced recently: Superior harbor, Basin Light No. 2 will be discontinued; Superior Front channel light No. 4 to be moved

500 yards 308 degrees to the position of the present Superior Front channel buoy No. 6, which will be discontinued, number will be changed to 2, no other change; Superior Front channel light No. 6 number to be changed to 4, no other change; Superior bay junction light, name to be changed to Superior front channel light No. 6, no other change; East gate basin light No. 2 to be moved 700 yards 136 degrees and name changed to Superior front channel light No. 8; Superior front channel buoy, 16, to be moved to the present position of East gate basin light No. 2 where it will be maintained as a temporary marker during dredging operations.

The steamer *SARANAC*, formerly owned by the Lehigh Valley Transportation Co., Buffalo, which vessel was taken over by the shipping board during the war, foundered in the Atlantic ocean recently. Her name had been changed to the *MINGAIA*. All the officers and crew were rescued.

A port committee composed of leading industrial managers and manufacturers, Erie, Pa., recently discussed plans for the restoration and development of lake traffic for that port. The plan of action to be taken up will begin with a census among Erie shippers to learn approximately the volume of freight they can ship via the lakes to Duluth and other points further west as well as to Detroit and other Michigan ports. Commercial organizations in western cities will be asked to take an interest in the project.

Fishermen on the ice about three miles west of Crisp point, near the Soo, picked up a frozen body bearing a life belt marked *JOHN OWEN*. From an identification card in one of the pockets, the body was found to be that of W. Reilly. The unfortunate man was assistant engineer of the *JOHN OWEN* which sank with all hands last November.

The carferry steamer *GRAND HAVEN* going into Milwaukee recently hit the breakwater, damaging her starboard quarter. She made temporary repairs to five frames and two plates.

Capt. Whitney Carr, Ashtabula manager of the Great Lakes Towing Co., died March 22 at Cleveland, where he attended the conferences of the company. He was taken suddenly ill after reaching his hotel. Captain Carr had been in Ashtabula since 1905 when he



became associated with the Great Lakes Towing Co. Prior to 1905 he sailed on the lakes, his last steamer being the P. P. MILLER. Captain Carr was a director of the Marine National bank, Ashtabula, and was identified with other prominent enterprises. He was 57 years old.

\* \* \*

Pickands, Mather & Co., with 16 underground and seven open pit iron mines in the Lake Superior region, are preparing for a busy season. Fourteen of the 16 underground mines are getting out ore and the remaining two are being kept free of water so that they can enter production later in the sea-

son. Of the seven open pits, one is now being stripped, the Scranton at Hibbing. This will be one of the great open pits of the Mesabi range. Stripping also has been in progress all winter at the Plymouth mine on the Gogebic range.

\* \* \*

Bids for the dredging of River Rouge will be received by the war department, April 15, according to a recent announcement of Col. E. M. Markham, United States engineer, Detroit. Contracts will be let at once and actual operations got under way in May, he said. The improvement will materially aid seven miles of deep water frontage

of Detroit and will make the River Rouge navigable from its mouth to the Dix avenue bridge for freighters 600 feet long, drawing 20 feet of water.

\* \* \*

The car ferry steamer PERE MARQUETTE No. 3, which was crushed by ice and went to the bottom of Ludington harbor during the early part of March, is in bad shape. She lies in 45 feet of water and it is reported that the chances of floating her are slight. Only the forward end of the steamer is out of water and that is sustained by the ice. Her cargo is valued at \$200,000 and it is thought there is some chance of salvaging a part of it.

## Up and Down the Pacific Coast

THREE new steamship services for Puget sound have just been announced. Two are to be inaugurated by private companies to South America and to Atlantic ports respectively while the third is to be established by the shipping board to the east coast of South America. The Pacific Mail Steamship Co. began a monthly service between Baltimore and Puget sound furnishing communication long desired. This is the first time the Pacific Mail has come to Puget sound. W. R. Grace & Co. are Seattle agents. The General Steamship Co. has taken over the fleet of the South American-Pacific line and will replace these Norwegian steamers by carriers flying the American flag operating to Mexico, Central America, Peru and Chile. Until other vessels are obtained, several allocated shipping board steamers will be used. This company has just bought from the government the 4200-ton steel steamer MERIDEN for \$718,994. A. M. Gillespie, Inc. has been appointed Puget sound agent for a new shipping board service between the north Pacific and River Plate ports, via the Straits of Magellan. Nine steel carriers have been allocated to this run and service began in April. Sailings are fortnightly.

\* \* \*

The Thorndyke-Trenholme Co., Seattle, has added the steel steamer JUNEAU to its South American fleet, augmenting service furnished by three other chartered carriers.

\* \* \*

Following exhaustive tests, the destroyer GWIN, built by the Todd Dry Dock & Construction Co., has been accepted by the government. On her 6-hour trial, the GWIN registered better than 31 knots, the contract requiring only 30.

\* \* \*

Ninety days from Manila, the 5-mast wooden schooner SNOW & BURGESS has arrived at Puget sound in a desperate plight. Buffeted by violent storms the vessel leaked at an alarming rate and the pumps were kept going continuously. Fearing that the heavy seas would rip out her planks, the captain managed to run two heavy wire cables under the hull to hold the vessel intact. The SNOW & BURGESS was bound for the

Columbia river but due to heavy weather and her condition, she was forced to make for Puget sound.

\* \* \*

Initial work has begun on the first unit of port terminals, Tacoma, Wash. Piling is being driven for the first open pier. Extensive dredging is to be done. The port has acquired 240 acres of water frontage and several million dollars will be expended on the several units. Tacoma anticipates direct connections with the Orient and other countries.

\* \* \*

The steamer STEELMAKER has inaugurated the new service of the Isthmian line between New York and Vancouver, B. C., bringing a cargo of steel and sugar. She will be followed by the STEEL VOYAGER and other new vessels, re-establishing a service interrupted by the war.

\* \* \*

Alaskans are deeply interested in the bill now before congress providing for a tax of \$3 per net ton on all ships entering territorial waters. This fund is designed to extend steamship service to ports not now served. It is argued that American vessels will recover this money by the additional business obtained while foreign vessels will pay for the competition they create.

\* \* \*

Within a short time, the work of transporting 50,000 coolies to China through British Columbia ports will have been completed. They have been moving for six months, 3000 to 4000 on each vessel. For each such passenger, the British government has paid the companies \$55.

\* \* \*

Marine underwriters on the Pacific coast have been heavily hit by the loss in European waters of the shipping board carrier WEST ALETA. While the hull was covered by the insurance fund of the board, about \$1,500,000 of the cargo was placed in San Francisco, giving that market a heavy loss.

\* \* \*

One of the principal changes being made in steamers built in Japan for the shipping board is in the forecabin. The Japanese builders constructed rough wooden bunks for the Japanese seamen.

However, they are too short to accommodate an ordinary size American sailor. Consequently the sleeping quarters have to be entirely rearranged with longer berths and more elaborate furnishings for the American who goes to sea.

\* \* \*

After braving the elements for 67 years, the famous old ship DASHING WAVE is a total loss near Seymour Narrows, B. C. This vessel was built in 1853 at Portsmouth, N. H., and for years was one of the most famous sailers under the American flag. During the Civil war she received a shot which has since remained in the hull. For several years she has been employed as a cannery tender. While being towed to Alaska she was carried aground by a treacherous tide and has since been abandoned. The cargo was salvaged. Within a few miles of this mishap, the passenger liner ADMIRAL EVANS sank the British tug CITY OF LUND in a fog. In maneuvering during this accident, the ADMIRAL EVANS ran ashore and remained fast for 36 hours. She was floated after lightering part of her cargo and proceeding undamaged.

\* \* \*

Henry G. Seaborn, vice president of the Skinner & Eddy company, has just purchased the wooden schooners METEOR and ANDY MAHONY. He recently acquired the schooner CAMANO.

\* \* \*

Portland, Oreg., and Seattle are engaged in friendly rivalry for the handling of 80,000 tons of phosphate rock which is to be shipped from the Idaho fields to Japan this year. The first shipment of 5000 tons is going through the Oregon gateway but the port of Seattle is making concessions to have it handled here. A water rate of \$14 per ton is being offered for the transportation to the Orient of this cargo. Heretofore Japan has obtained its supplies of phosphate from South Pacific islands.

\* \* \*

The Seattle-North Pacific Shipbuilding Co. is expecting a contract for five steel coastguard cutters, having submitted the lowest bid of \$689,000 for each vessel as against \$789,000 asked by a San Francisco yard. The local plant, which has completed delivery of ten 9400-ton steel

vessels to the shipping board, is ready to begin immediate construction.

\* \* \*

The Esquimalt, B. C. naval yard was closed April 1 and vessels attached to the yard were transferred to other departments. Esquimalt has been used as a British naval base since 1845.

\* \* \*

Capt. Ralph Peasley, a widely known Pacific sailing master, is taking the new schooner VIGILANT from Grays Harbor to Australia with a cargo of lumber. Captain Peasley is famous because he is said to be the original of one of the characters in Peter B. Kyne's stories of the sea. The VIGILANT is entitled to

distinction because she is the first community owned ship credited to the state of Washington. The new vessel also has most luxurious quarters for both officers and crew. In the fore'sle, the men are berthed two in a room. Each has a locker and there are baths, wash-stands and other conveniences usually foreign to sailing ships.

\* \* \*

Included in the 7000 tons of general cargo taken from Seattle by the Japanese liner SUWA MARU were seven huge tractors consigned to ports in Japan.

\* \* \*

Two new 18,000-ton freight and passenger liners, the ARIZONA MARU and

ALABAMA MARU are about ready to enter the service of the Osaka Shosen Kaisha between Hongkong and Seattle, adding materially to this line's carrying capacity.

\* \* \*

The Washington state training ship VICKSBURG is overhauling at the Puget sound navy yard preparatory to an extended summer cruise which will take the cadets to the Panama canal, Honolulu and then into Alaskan waters.

\* \* \*

The Wallace yards, Vancouver, B. C., have begun construction of the first of two 8100-ton steel steamers to be built for the Canadian government.

## Late News From Atlantic Seaboard

THE permanent freight port of the Fabre line will be Providence, R. I., instead of New York as originally planned. The steamers ASIA and BRAGA previously plying between Marseilles and African ports will be sent to Providence in the service of this line. The ROMA recently docked at Providence after her first trip to that port from Marseilles.

\* \* \*

The ONTARIO has been taken from the service from Norfolk, Va., to Havana and placed in the run between Philadelphia and Boston.

\* \* \*

The steamers LAKE BUTLER and LAKE WEIR now at Boston have been sold by the shipping board to the Lloyd Royal Belge for trade in European waters.

\* \* \*

The Massachusetts Institute of Technology is to obtain funds for building the Pratt school of naval architecture and marine engineering from the estate of Charles H. Pratt, who died May, 1912, according to a decision recently handed down by the supreme judicial court.

\* \* \*

The 4-mast schooner JERE G. SHAW, Biddeford, Me., went ashore the latter part of March off Sand point in a position so dangerous that the crew was forced to abandon her. The vessel was bound from St. Marc, Haiti, for New York. The vessel was 193 feet overall with a capacity of 1300 tons and was commanded by Captain Cole, of Boston.

\* \* \*

The JEREMIAH SMITH, Boston, loaded with coal from Newport News was abandoned at sea and sank during the latter part of March. The crew was picked up by the American steamship HATTERAS from Gibraltar and reported the reason for the trouble was the encounter of heavy gales and rough seas which caused a leak.

\* \* \*

Secretary Daniels has written Mayor Peters of Boston to the effect that construction and repair work for the navy will be apportioned fairly between the different yards, giving the Boston yards their full share. The letter states that

due to lack of funds, it will be necessary for the department to drop 13,000 capable men from the navy yards.

\* \* \*

A little over 41 years ago the GUY C. Goss was launched from a Bath, Me., shipbuilding yard and sailed down the Kennebec river and off for the Pacific coast. She is now owned by the Northwestern Fisheries Co. and used in the salmon cannery business.

\* \* \*

The harbor committee of the chamber of commerce, New Haven, Conn., has been working for months on plans for a greater New Haven harbor. A new plan will be sent to Major Robbins of the United States army engineers as soon as possible.

\* \* \*

At a recent banquet of the New England Purchasing Agents association at Boston, Howard Cooley, who during the war was vice president of the Emergency Fleet corporation, spoke at some length on the work of that corporation, particularly of its activity in the wooden ship line. The Emergency Fleet corporation, he said, purchased enough lumber for wood ships to build a bridge across the Atlantic ocean 12 feet wide, 4 inches thick and having a 3-foot railing on each side.

\* \* \*

Matthew C. Brush, president of the American International Shipbuilding Corp. at Hog Island, N. Y., was the principal speaker at a recent dinner given by the Massachusetts Institute of Technology graduates in Boston. Mr. Brush described in considerable detail the plant at Hog island recounting its history from the time of its inception up to the present, and illustrating his talk with moving pictures of some interesting features of its activity. Contracts at the Hog island plant call for the building of 122 ships.

\* \* \*

A wireless telephone has been installed in the communication office at the Charlestown navy yard, Charlestown, Mass., by which means communication is possible with the various ships at anchor or at dock. Incoming vessels will be able to get in direct

telephonic communication with the commandant of the yard when still some distance off shore.

\* \* \*

The British steamer GENERAL CURRIE has been secured for the line from Boston to Halifax and St. Johns, N. S. This will be the largest vessel on the line. The first sailing will be made April 15.

\* \* \*

The United States submarine S-7 was launched from the yard of the Lake Torpedo Boat Co. at Bridgeport, Conn., recently. The new craft is 245 feet long and was sponsored by Mrs. Lake, wife of the inventor.

\* \* \*

Recent naval orders received at Portsmouth, N. H., are to the effect that three new submarines to cost \$10,000,000 and of the large type, will be built at the navy yard there. At least one will be started during the present year.

\* \* \*

Riveters of the Lake Torpedo Boat Co., Bridgeport, Conn., claim a new American rivet driving record. Recently 20 gangs consisting of four men each made the remarkable average hourly tally throughout six days of 50½ rivets per gang. The rivets varied from ¾ to 7/8 inches in size and the work was done on double hull boats which makes the record all the more remarkable. The nearest approach to the Bridgeport men's record is an average of 49 rivets made by riveters of the Great Lakes district.

\* \* \*

The fleet of idle wooden vessels at the South Boston, Mass., army base has continued to increase during the past month. One after another, wooden vessels owned by the shipping board are being laid up at this dock. Fifteen are now berthed there and two others will be added to this fleet as soon as their cargoes of coal have been discharged.

\* \* \*

The steamship ROCK ISLAND BRIDGE, 3174 tons, on its maiden voyage on the Roger & Webb line from Portland, Me., to Antwerp was sunk in a collision off the coast of France. Capt. S. C. Stacey, Boston, was in command.



# Practical Ideas for the Engineer

## Propeller Repaired Through Cofferdam Without Docking Ship — Unusual Welding Problems Met in Restoring Lighthouse Supports

**F**OR the first time in the history of Puget sound ship repair yards, a cofferdam has been used to repair a deeply laden steamer without disturbing the cargo and without taking her from the water. This feat was successfully accomplished by the Skinner & Eddy Shipbuilding Co. on the shipping board steamship **BRAVE COEUR**. The vessel was equipped with a new propeller and new blades without moving a pound of cargo. It is estimated that more than \$50,000 was saved in ship's time and labor. From now on, the cofferdam will be retained as a permanent part of the yard's equipment.

The **BRAVE COEUR** is a 10,000-ton cargo carrier built at the Skinner & Eddy yards. Assigned to Struthers & Dixon, she was dispatched for Oriental ports. When 400 miles off Cape Flattery, she broke a propeller blade and bent two others. She returned to Seattle for repairs, arriving at 8 p. m., Feb. 27. Fully repaired, she sailed from Seattle, without having to dock or discharge cargo, at midnight, March 9, thus establishing a record for the repair yard. Had the **BRAVE COEUR** been docked most of her 8500 tons of cargo would have had to be moved twice, causing considerable delay and heavy labor expenses in addition to the loss of ship's time.

When the disabled vessel limped back, J. J. Mooney, steel construction superintendent of the Skinner & Eddy company,

advocated the building of a cofferdam and the shipping board awarded the job to that firm. In three days the cofferdam was built. It was submerged at the stern of the ship at 5 a. m., March 6, and the work of pumping out the water was completed in a few hours. By 4 p. m. the same day, all the blades and the cracked hub were removed. The tailshaft was drawn into the shaft tunnel for inspection and returned. The removal of the propeller blades was no easy task as each is 7 feet long and weighs 3500 pounds. The new hub was ready and installed on March 8 and the entire job completed early on March 9.

Cofferdams have previously been used for repair jobs at other Pacific coast ports but not at Seattle. In November, 1916, a Norwegian steamship, the first product of the Skinner & Eddy plant, was brought into Esquimalt, B. C., with her propeller stripped. David Rodgers, then general manager for Skinner & Eddy, devised a cofferdam for this job and it worked successfully.

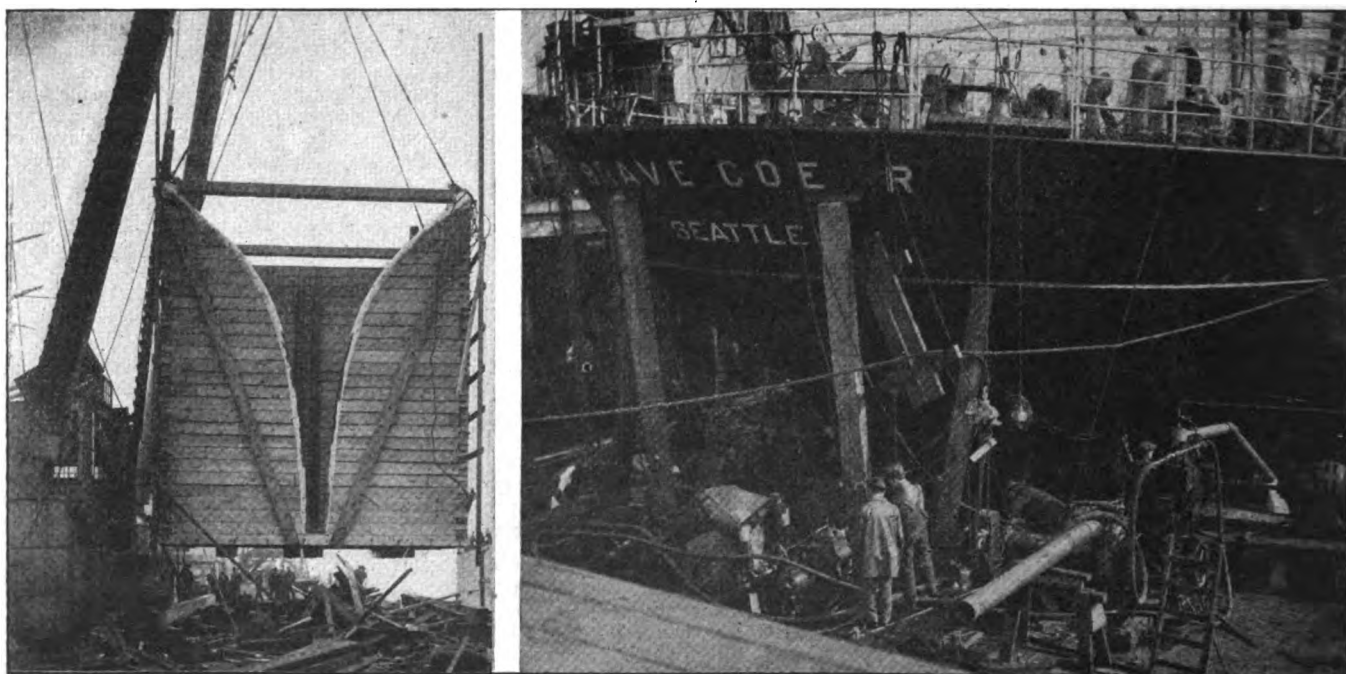
As shown in the accompanying illustration, the cofferdam has three sides and fitted the stern of the vessel. Care had to be exercised in building it so that it would conform to the ship's lines. The cofferdam is 22 feet square, 30 feet deep and is built of 12 x 12-inch timbers. While the open side fitted snugly about the stern of the vessel, packing and oakum were used to stop leaks. The

**BRAVE COEUR** was drawing 28 feet at stern and the dam had to be submerged until its top was 17 feet below the surface. Then it was permitted to rise slowly until it fitted around the ship's frame at the stern. The water was pumped out, thus giving the workmen a below the surface open space in which to take off the broken parts and effect repairs. The buoyancy of the cofferdam was so great that it raised the stern of the **BRAVE COEUR** 18 inches although the big carrier was laden to capacity.

### Unusual Repair Job

Out of the ordinary marine repairs handled under unusual conditions generally call for the exercise of considerable skill and ingenuity. This is shown in work recently done at the Wade Point lighthouse in Albermarle sound, N. C. During the winter of 1917-1918, heavy ice floes broke the five cast iron columns that support the lighthouse. The iron tie rods held the lighthouse in place, preventing it from collapsing. After temporary repairs were made by driving wooden piles, it was decided to make permanent repairs by the thermit process.

Thermit is a mixture of aluminum and iron oxide. It is fired by means of a igniting powder and upon reaction it produces a heat of 5000



AT THE LEFT IS THE COFFERDAM CONSTRUCTED TO FIT THE VESSEL'S STERN—WORK OF PREPARING THE PROPELLER IS SHOWN AT THE RIGHT



CRUCIBLE SET IN PLACE READY TO POUR

degrees, Fahr. The mixture is hot enough to melt and dissolve the metal with which it comes in contact. When cool it amalgamates forming a solid homogeneous mass.

The five columns were jacked up and welded one at a time. After jacking up, a portion of the fracture was cut away to make space for the molten thermit. As the columns were hollow, with walls  $7\frac{1}{2}$  inches thick, the interior spaces were filled with molding sand for the thermit steel mold to a depth of 3 to 5 feet below the mold.

Packing the molding sand inside the columns was a slow job due to the fact that it had to be rammed up by means of a bent rod without the interior being visible to the operator. After the upper section of the column was rammed, rope was wrapped around the break to prevent the escape of sand. After the column was rammed up to a height of 12 inches above the break, the sand at the break was removed with a trowel and yellow wax applied to form a pattern. The wax was inserted  $1\frac{1}{2}$  inches within the inside of both the upper and lower sections and shaped around the outside of the break in the form of a tapering collar 6 inches wide and  $\frac{3}{4}$  inch thick at its center.

The base of the mold box consisted of two plates fitted around the column and supported partly by tie rods and partly by three angle irons bolted to the column. The mold box was 18 inches deep, 24 inches wide and 36 inches long, its length being sufficient to project under the crucible. The pouring gate pattern was set diagonally outward while two heating gate patterns were placed horizontally against opposite sides of the wax pattern in order to give proper circulation to the preheating flames.

Four riser patterns consisting of wooden blocks 10 inches long and

$1\frac{1}{2}$  x 3-inch sections were inserted with beveled edges against the wax pattern and slanted upward and outward. The risers formed from this pattern served to feed thermit steel into the weld when the metal in the latter contracted just after pouring, thus taking care of all shrinkage in the weld. Additional riser patterns in the form of small pieces of wood  $1\frac{1}{4}$  inches thick and 1 inch wide were placed against the column vertically above the wax for the purpose of preventing the walls above the weld from sloughing away and also to permit escape of gases. The arrangement of these small risers is shown in the accompanying view of the finished welds.

The sections were preheated by means of two kerosene torches supplied with compressed air. In each case, the preheating took from  $2\frac{1}{2}$  to 3 hours. The lighthouse was amply protected from any possibility of catching fire during the reaction by shielding all exposed parts with asbestos sheets.

The crucible used for the reaction was supported on a tripod, the feet of which rested on temporary wooden staging. When the crucible was set securely in place over the pouring gate of the mold box, the ignition powder which lay on the top of the thermit in the crucible was ignited and the reaction thus started. Each weld was allowed ample time to cool, after which the mold box surrounding the weld was dismantled and the pouring and heating gates and risers cut off.

The welds, all of which proved entirely satisfactory, required from 125 to 175 pounds of thermit, according to the size of opening cut out, making a total of 750 pounds for the five columns. The columns were welded together in their bent posi-



ONE OF THE FINISHED WELDS AT WADE POINT LIGHTHOUSE



ONE OF THE BROKEN COLUMNS

tion. No attempt was made to straighten them, as it was impossible to force the piles back to their original position, and if the cast iron columns themselves had been bent they would have broken off. The actual time consumed in making the five welds was a little less than three weeks. When compared with the probable cost of replacing the broken columns with new ones, a substantial saving is shown.

## Late Marine Patents

Copies of any of the following patents can be obtained by sending 25 cents in stamps to Siggers & Siggers, National Union Insurance building, Washington, by mentioning THE MARINE REVIEW.

- 1330077—Swing derrick for ships and the like, Otto Kahrs, Christiania, Norway.
- 1330109—Boat, A. J. Bottorff, Sawtelle, Cal.
- 1330503—Gyroscopic apparatus for ships, H. H. Thompson, Brooklyn, N. Y., assignor to the Sperry Gyroscope Co., Brooklyn, N. Y.
- 1330517—Ship construction, Richard S. Chew, San Francisco.
- 1330755—Submarine boat, Phillip H. Brill, Bridgeport, Conn., assignor to the Lake Torpedo Boat Co. of Maine, Bridgeport, Conn.
- 1330830—Apparatus for laying off or ascertaining ships' courses, Haynes Bringe Enkop'ing and Harry Hammer, Stockholm, Sweden.
- 1330898—Apparatus for signaling and recording the course steered by vessels, R. S. O'Neill, London, Eng.
- 1331014—Device for raising sunken ships, Peter Kawinski, Perth Amboy, N. J.
- 1331101—Propeller, F. J. Gallagher, Wilkes-Barre, Pa.
- 1331586—Propeller, Bruno Schmelzer, Jersey City, N. J.
- 1331604—Composite vessel, J. L. Weller, St. Catherine, Ont.
- 1331610—Device for raising sunken vessels, Walter C. Beckwith, Fostoria, O.
- 1331819—Lifeboat and diving apparatus, Thomas D. Matheny, Pontiac, Mich.
- 1332199—Ship construction, Frank Bogucki, Fairfield, Conn.
- 1332337—Ship's davit, Harry B. Hills, Tompkinsville, N. Y., assignor to Steward Davit & Equipment Corp., New York.
- 1332384—Ship raising apparatus, M. Dray, Coatesville, Pa.
- 1332631—Submarine propulsion system, Robert V. Morse, Ithaca, N. Y.



# Equipment Used Afloat, Ashore

Crankshaft Milling Machine — Pneumatic Scraper — Ship's Log — Steam Drum Type Steering Engine — Portable Welding Outfit for Shipyards

**W**HEN the outside surfaces of crankshaft cheeks are machined on a lathe, lost motion ensues and needless expense is incurred during the time the crankshaft revolves in the lathe and no cutting is done. To eliminate these inefficiencies, the Newton Machine Tool Works, Inc., Philadelphia, has developed the crankshaft check milling machine shown in the accompanying illustration.

This machine has a 32x72-inch platen, on which is fitted a pair of centers for holding the crankshaft, holding fixture. The top side of the latter is adjustable crosswise by means of a rack and hand-operated pinion. This platen has a forward and a reverse fast power traverse and hand adjustment, controlled by a revolving screw and a stationary nut. Six changes of gear feed to the platen are obtained through sliding sleeves on which the gears are mounted in an oiltight box. These sleeves are controlled by latch levers

crankshaft holding fixture is located a pair of centers for holding the crankshaft, the maximum distance between them being 15 feet. The right-hand center is rigid while the left one has a hand adjustment to permit its insertion into the centers of the crankshafts. Both centers are adjustable upon the top slide. The distance from the top of the latter to the center of the center in which the crankshaft is placed is 11 inches. Suitable hand operated arch clamps are used to clamp the cranks while the machine is in operation.

Each cutter head is a solid steel casting having machined slots for the tools. The driving gear teeth are cut from the solid in the rear of the head. The width of each wing on which the spindle saddle is mounted is 56 inches and the actual length of each spindle saddle bearing on the wing is 50 inches. The height of each wing above the floor is 18 inches while the height of the main base on which the main table is supported is

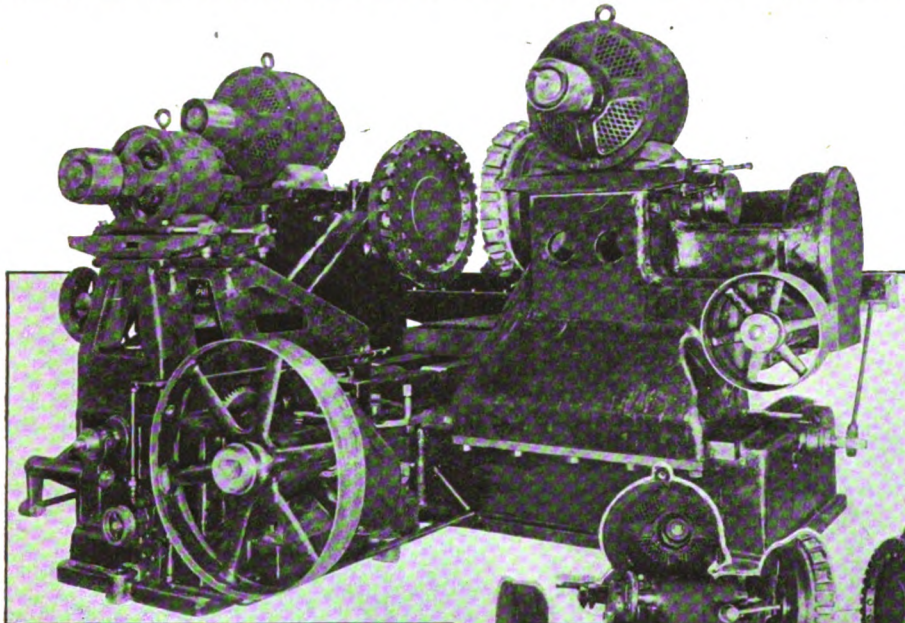
28 inches. The cutter heads are driven by individual motors through inclosed internal gears. The platen is driven by a motor of the interlocking control type, so that in the operation of stopping the platen, the motor will stop first and in the operation of starting, the two driving motors for the cutter heads will start first.

## Pneumatic Scraper

To scrape large surfaces to an accurate bearing is a comparatively long process involving tedious hand labor. With the object of expediting this class of work, the Anderson Bros. Mfg. Co., Rockford, Ill., recently developed the pneumatic scraping device shown in the accompanying illustration.

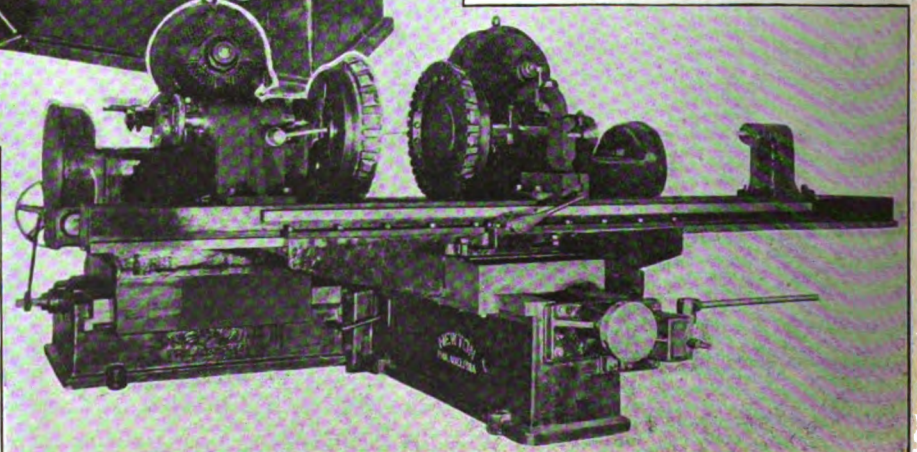
The appliance consists principally of an air cylinder actuating the piston which controls the movement of the scraper. The scraper blade is fastened to the rod that carries it by means of a screw and is readily removed for sharpening. To operate the device, a slight forward movement of the right hand, which grips the valve control, causes the forward stroke. Slightly releasing the hold on the valve causes the return stroke. The length of the stroke is determined by the operator who acts in accordance with the requirements of the work. The rod that carries the blade is mounted on a ball bearing pivot so that the scraper can be readily turned over to utilize the other side, the same as in hand scraping.

The device is furnished on both stationary and portable bases, the illustration showing a portable base.



outside the cover. The main platen has a 30-inch feed and hand adjustment along the base.

Each cutter head is 40 inches in diameter over the cutting tools and each cutter head saddle has an independent hand adjustment on its wing. This permits the heads to operate within 4 inches of each other, with a maximum distance between cutters of 30 inches. On the top slide of the



DOUBLE HEAD MILLING MACHINE DESIGNED FOR FINISHING CRANKSHAFT CHEEKS



This feature allows the scraper to be taken to the work instead of bringing the work to the scraper. The base column is provided with a bracket, with an up and down adjustment, that carries a beam on which the trolley to which the device is fastened, travels on four rollers. Just as soon as air is admitted to the device, the trolley is automatically locked to the beam. When the air is released, the trolley is unlocked and free to move. The scraper ram is fastened to the trolley by means of a universal joint so that it may be moved in any direction desired. The air cylinder is designed to draw the scraper back automatically so that it is always ready for a new stroke. Under the air cylinder is an oil governor which is adjusted to regulate the speed of the forward stroke while the backward stroke always has a quick return.

It is pointed out that the device sacrifices none of the human touch, so essential in accurate scraping, and that it relieves the operator from the manual labor of pushing the scraper. It is claimed that by using the device one man can scrape three times as large a surface in a given time as he could with a hand scraper.

### Automatic Ship's Log

The device shown in the accompanying illustrations is an automatic log for registering the distance traveled by a vessel. It is a development of the Cummings Ship Instrument works, Boston, and is in use on many types of oceangoing vessels and on the battleships, destroyers and sub-

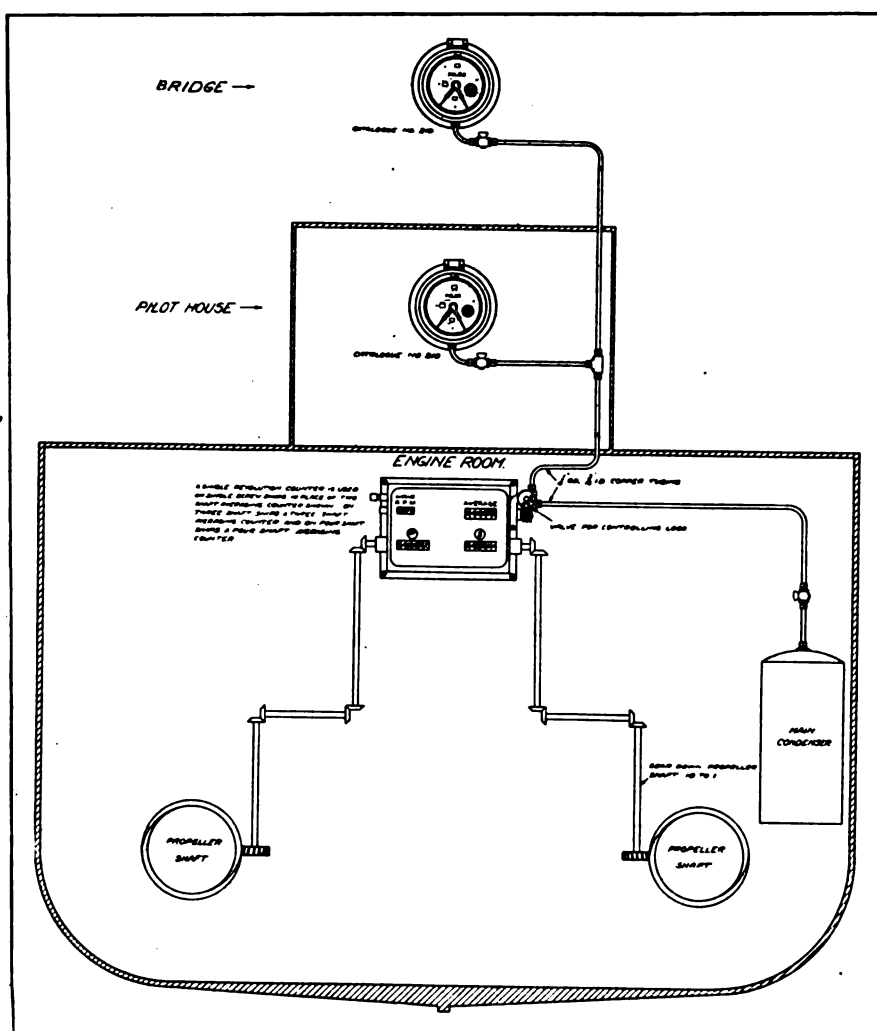


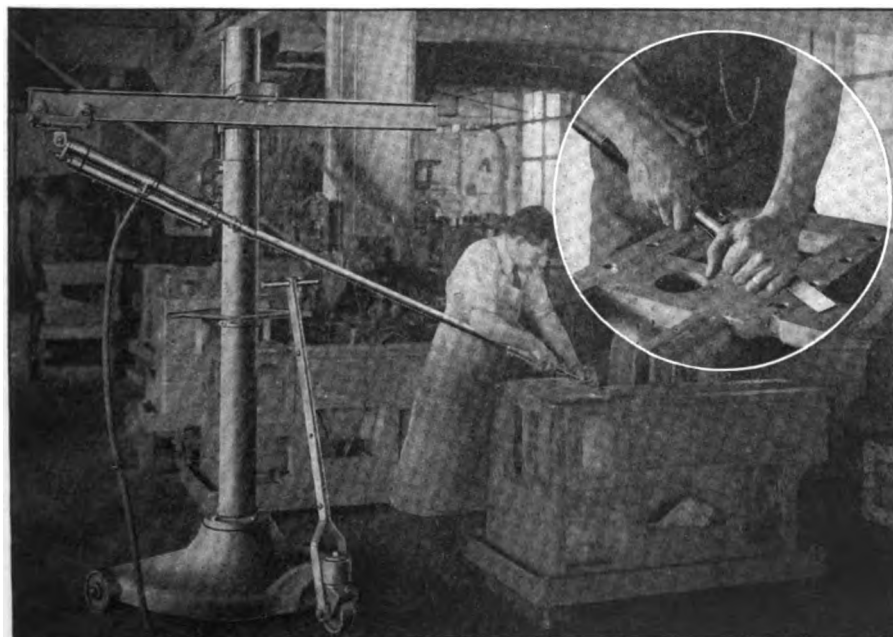
FIG. 1—INSTALLATION OF LOGS AND COUNTERS ON A 2-SHAFT VESSEL

marines of the United States navy. The device has also been installed on more than 200 cargo vessels of the United States shipping board. The distance registered is con-

trolled by, and is a function of, the speed and revolutions of the ships' propellers.

This log, it is pointed out, does not embody a new principle. It is a modification of the present method of navigating by dead reckoning except that the log is automatic and instantaneous in calculating, eliminating the possibility of personal error and time. The navigating officer is not dependent upon the engine room for the necessary information for calculating speed, distance, etc., for the log shows at all times the exact distance traveled.

This log is shown in Fig. 2. The instrument reads directly the total distance covered by the ship. The hundred miles are shown on the small dial to the left, the miles by the main hand on the large dial and the tenths of miles on the small dial to the right. The instrument shown reads 68,266.5 miles. The course hands indicate that the ship has traveled 41.2 miles since last set at zero. These hands can be reset at any time without interfering with the main reading. The small indicator at the



PNEUMATIC SCRAPER IN OPERATION



bottom marked "total average revolutions," registers the revolutions of the propeller on a single shaft vessel or the average of all propellers on vessels of two or more shafts. The small indicator at the top marked "revolutions per knot" is set to the revolutions of the propellers necessary to push the ship one nautical mile through the water. In the instrument shown the indicator is set to 745 revolutions per mile, which means that the log will register one nautical mile for every 745 turns of the propellers. This indicator can be set by the key shown at the right, as may be necessary for any change in conditions, as when the ship has a much greater or less displacement than normal

or at high or low speeds. Diagrammatic installation of the log system as used on destroyers is shown in Fig. 1. Two logs are used on destroyers, one being located in the pilot house and the other on the bridge. Any number of logs may be operated on the same system and on battleships they are generally installed on the bridge, in the chart house, conning tower and central plotting station.

The log is controlled by a rotary valve attached to the engine counter in the engine room and is operated by vacuum with the main condenser as a source of energy. The logs are connected as shown in Fig. 1 by a 1/8-inch inside diameter pipe to one side of the rotary valve on the counter. The other side of the valve is connected to the main condenser. On merchant ships, this valve opens and closes every 50 revolutions of the engines, thus causing a vacuum impulse in the log line every time the engines turn over 50 revolutions. These impulses actuate the recording mechanism of the log. The amount of air exhausted from the logs is so small that it can make no practical difference in the vacuum of the condenser. On submarines and other vessels not fitted with condensers, a small vacuum pump

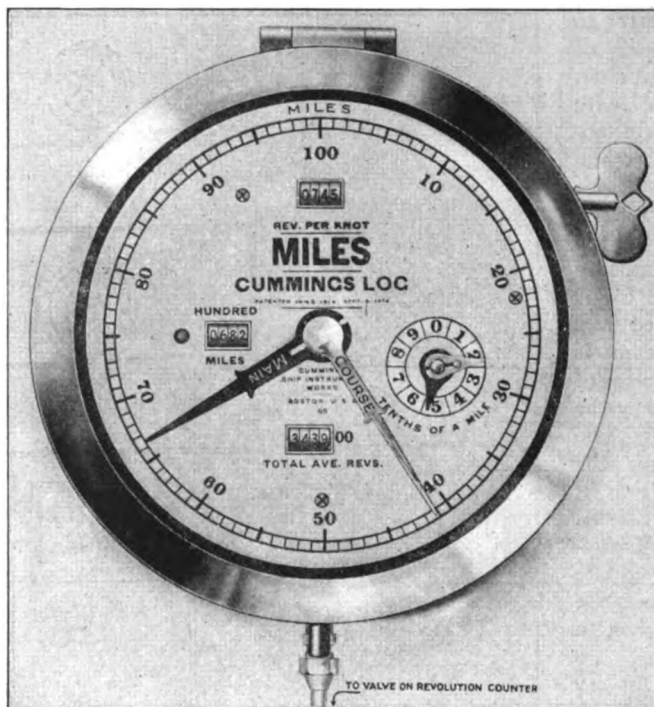
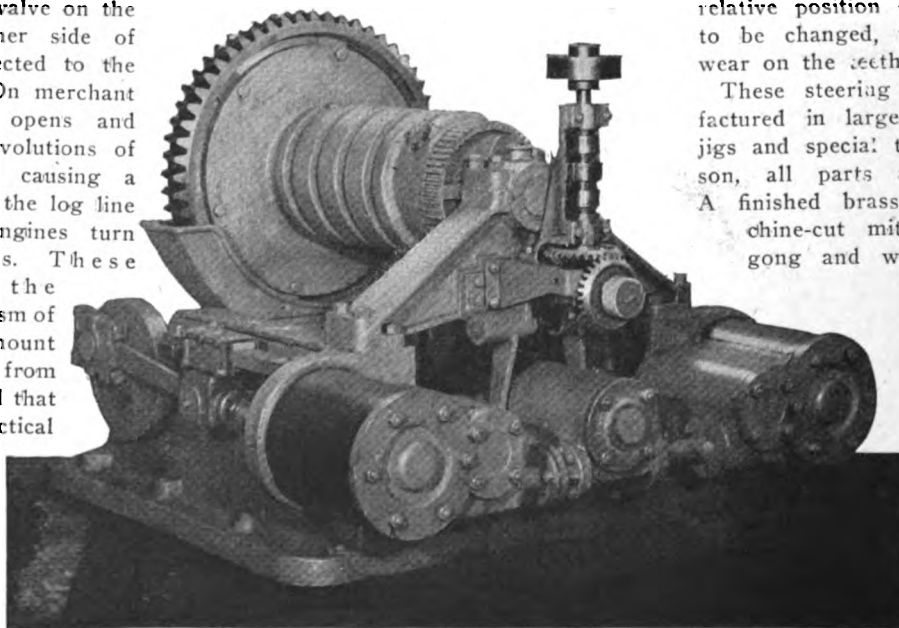


FIG. 2—ENGINE ROOM LOG WHICH GIVES TOTAL DISTANCE COVERED

geared to the propeller shaft is used to produce the necessary vacuum. In other respects, the connections are the same as described above.

### Steering Engine

The steering engine shown in the accompanying illustration is a recent development of the American Clay Machinery Co., Bucyrus, O. It is of the steam drum type and is connected to the tiller or quadrant by means of chains or tiller ropes, as specified. The unit is self-contained and in its design the parts are proportioned to take up as little room as possible when installed aboard ship.



SELF-CONTAINED STEAM DRUM TYPE STEERING ENGINE

An important feature involved in the design of this unit is that the front cylinder heads are cast integral with the side housings, as are also both brackets for holding the crosshead guide bars. This, it is pointed out, insures perfect alignment of the cylinders, crossheads and crankshaft. Also it brings the bolts that hold the cylinders in place on the housings in tension instead of in shear. The cylinders are bolted to the front cylinder heads with a ground joint and are covered with sheet metal jackets. The steam chest carries a piston valve. The chest is equipped with a removable liner to facilitate repairs. To insure proper alignment, the cylinder and steam chest

bores are machined at one setting. The piston rings, steam chest valves, reverse valve, piston rods, valve stems, crank and wrist pins are all finished by grinding to insure accurate sizes and ready duplication. Good fits are also assured by this practice which reduces friction to a minimum. The crosshead is of the locomotive hung type.

The worm wheel is hard bronze while the worm gear with which it meshes is cast iron. Both units have accurately cut teeth. The worm wheel is bolted to the drum, the bolt holes being accurately spaced and made interchangeable. This is an important feature as it permits the relative position of the worm wheel to be changed, which insures equal wear on the teeth.

These steering engines are manufactured in large lots by means of jigs and special tools. For this reason, all parts are interchangeable. A finished brass column with machine-cut miter gears, indicator, gong and wood wheel for the pilot house accompanies each unit. The column is fitted with a brass shaft which extends 2 feet below the column base. A large number of these steering engines are in operation on deep water vessels of various types.



### Portable Welding Outfit

The unit shown in the accompanying illustration is a portable electric welding outfit developed by the United States Light & Heat Corp., Niagara Falls, N. Y. The truck on which the outfit is mounted is 4 feet 6 inches long, 2 feet 4 inches wide and 4 feet 7 inches high. The outfit may thus be used in a crowded machine shop or taken almost anywhere in the shipyard. The compactness of the outfit permits it to be taken aboard ship should occasion require. The complete outfit weighs 1530 pounds. The unit consists of a motor-generator, panel, reactor, cable reel and truck. The truck is supported on roller bearings while the wheels are malleable iron. Nothing extends beyond the truck guard rails while substantial curtains are provided to exclude rain and dust.

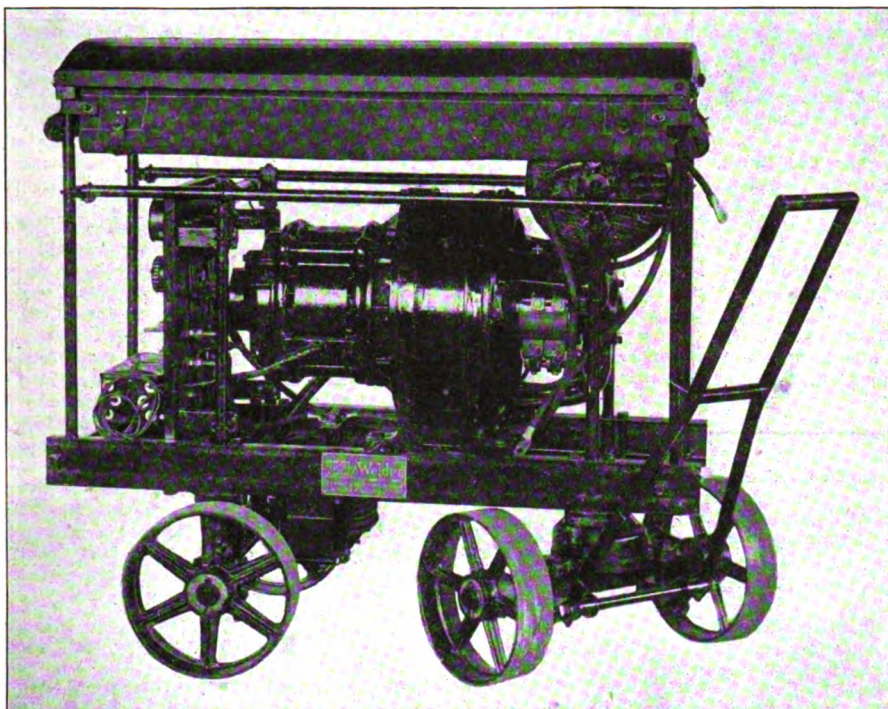
The motor-generator is a compound wound, self-exciting machine with a drooping voltage characteristic. It is de-

signed for quick voltage response with no appreciable lag. An instantaneous drop in voltage is secured when the electrode is short circuited and an immediate recovery when the arc is es-

A double-pole, double-throw, 200-ampere switch is provided which enables the operator to make his electrode negative or positive at will. Both positions are marked so that the operator cannot

make a mistake. The reactor is designed to choke current rushes when striking an arc and to sustain the arc after it is made. This is designed to give uniformly hot arc necessary for efficient work. The cable reel carries two 50-foot lengths of flexible cable for conveying current to the arc. The cable is provided with varnished cambric insulation protected by a heavy impregnated cover. The cables are connected electrically with the generator through the

medium of slip rings and brushes mounted on both sides of the reel. Rotation of the reel is retarded by a spring, which prevents the paying out of more cable than is needed. This feature protects the cable from undue wear which results when the cable is left on the ground or floor.



SELF-CONTAINED WELDING OUTFIT FOR SHIPYARD USE

established. The armatures of both motor and generator are mounted on one shaft. The outfit is adapted for either direct or alternating current in voltages commonly used. The panel is made of composition board, proportioned to withstand rough handling, and carries meters, switches and a circuit breaker.

## Business News for the Marine Trade

The American Bridge Co. recently received the contract for 40 steel hopper barges from the La Belle Iron Works, Steubenville, O. These barges, which will be 140 feet long, 26 feet wide and 10 feet deep, will have a capacity of 600 tons each. They will be used to transport coal from the company's mines at Harmarville, Pa., on the Allegheny river. The contract involves about 5000 tons of steel. The American Bridge Co. has three more barges to complete for the railroad administration and now has one of seven ordered by the Standard Oil Co., on the ways.

The Wanda Shipping Corp., boats, etc., recently was chartered in Delaware with \$100,000 capital, by W. F. O'Keefe, W. L. Buchler and George C. Steigler, Wilmington, Del.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has contracted with Westinghouse, Church, Kerr & Co., New York, for the erection of four new buildings at South Philadelphia, Pa. These structures will care for the immediate needs of the company, incidental to the removal of the machine works, formerly the Westinghouse Machine Co., from East Pittsburgh. The four structures will be of terra cotta and steel construction, and will be similar in design

to the present buildings on the site. The light machine shop unit will be 1-story, 130 x 500 feet, and will be utilized in building small turbines, operating pumps and generators. Large land and sea steam turbines will be machined in another machine shop unit, which will be 130 x 750 feet. An erecting shop will be 300 feet in length, while a 3-story, 50 x 600-foot structure will be used as a warehouse. Practically all machinery necessary will be transferred from the East Pittsburgh works, and all will be motor driven.

A. Walker, E. V. Willis and F. M. Caughey were named as the incorporators of the Port Washington Shipyard & Motor Co., Port Washington, N. Y., which was recently chartered with \$30,000 capital.

Among the recent incorporations to engage in a maritime business, is that of the Tobey-Crane Co., Brooklyn, N. Y., which is capitalized at \$5000. This company, which was incorporated by C. Bohlen, J. G. Tobey and J. W. Crane, 315 Greene avenue, Brooklyn, N. Y., will engage in business as a marine engineer.

Operation of boats of all kinds will be the business engaged in by the Perhaspake Towing & Trans-

portation Corp., which was recently chartered with \$2,000,000 capital, by W. L. Spangler, J. M. Frere, Wilmington, Del., and J. A. Frere, Newark, N. J.

The Reliance Marine Equipment Co., New York, recently was chartered with \$50,000 capital, by C. R. Sundberg, J. M. Golden and J. Reid, Hotel Manhattan.

The Russian, Slavic & American Steamship Corp. has been incorporated in Delaware to operate boats, etc., with \$3,500,000 capital, by T. L. Croteau, M. A. Bruce and S. E. Dill, Wilmington, Del.

Capitalized at \$1,500,000, the European Navigation Corp., New York, recently was organized to operate boats, by S. B. Howard, Harry C. Hand and George V. Reilly.

Robert K. Thistle, George V. Reilly and Harry C. Hand, New York, were named as the incorporators of the Consolidated Steamship lines, which was recently chartered with \$10,000,000 capital.

The Mears Towing Co., Brooklyn, N. Y., recently was incorporated with \$50,000 capital, by L. N. and J. A. Martin and P. J. Dobson.

The Lord Dry Dock Corp. recently was incorporated in Delaware to engage in shipbuilding, with \$20,000,-



## Business Changes

The International Maritime Corp. has opened a Chicago office at 29 South La Salle street with M. Hartman in charge.

H. W. St. John & Co., foreign freight forwarders, have opened a Boston office in charge of Curtis T. Franklin.

W. A. Blake & Co., Baltimore, vessel operators, have opened a New York office at 59 Pearl street.

The Ocean Paint Works, Inc., has removed its New York sales office from 54 Front street to 15 Whitehall street, New York.

The Diamond Power Specialty Co., Detroit, manufacturer of soot blowers, has opened an office in San Francisco, 819 Monadnock building, in charge of Thomas J. Pizzotti.

The Chicago Pneumatic Tool Co., Chicago, has moved its general offices to the Chicago Pneumatic building, 6 East Forty-fourth street, New York.

The Carter & Weekes Stereodoring Co., New York, has opened a branch office at 511 American building, Baltimore, with W. H. Weekes Jr. in charge.

000 capital, by T. L. Croteau, M. A. Bruce and S. E. Dill, Wilmington, Del.

The International Coal Transportation Corp. recently was chartered in Delaware with \$2,700,000 capital, to operate boats, etc., by Frank H. Hall, Englewood, N. J.; Henry V. Julier, Mt. Kisco, N. Y., and George F. Milley, Glendale, N. Y.

Capitalized at \$5000, the Unsinkable Life Saving Suit Co., New York, recently was incorporated by W. T. McCoy, C. Mardenbro and R. Washington, 427 West Fifty-second street, New York.

Motors, machinery, tools, etc., will be manufactured by the Ericson Marine & Aircraft Tool Co., Ltd., Toronto, Ont., which was recently incorporated with \$500,000 capital, by Thomas L. May, 427 Queen street; Harry A. Newman, 59 Victoria street, and others of Toronto.

The Oklahoma Engineering, Machine & Boiler Co., Muskogee, Okla., recently was incorporated with \$75,000 capital, by John Dunn and others.

L. E. Dillon, Z. McCormick and J. E. Simmons were named as the incorporators of the Brazos Boiler Works, 1115 Mary street, Waco, Tex., which was recently chartered with \$50,000 capital.

Capitalized at \$20,000, the Capital City Boiler Works, Baton Rouge, La., recently was incorporated to manufacture boilers and tanks, by Theodore Dupre, Sylvester Bros. and W. P. Cornell.

The Scotch Boiler & Equipment Co., New York, recently was incorporated with \$10,000 capital, by G. A. Senior, A. M. Schileman and H. Rosenthal, 2118 Dean street, New York.

The Crowninshield Shipyard, South Somerset, Mass., is reported planning the erection of a plate shop at an estimated cost of \$60,000.

Capitalized at \$10,000,000, the Submarine Exploration & Recovery Co., Augusta, Me., recently was incorporated. P. A. Leland is treasurer of the company.

Organized with \$100,000 capital, the Milford Shipbuilding Co., Stratford, Conn., recently was chartered to build ships, by John O'Neill, E. R. Foster and P. C. Myers, Bridgeport, Conn.

The Simpson-Patten Dry Dock Co., East Boston, Mass., is reported to have awarded a contract for the erection of a 2-story, 40 x 120-foot carpenter shop.

The Winnissimmet Ship Yard, Inc., Chelsea, Mass., has been incorporated to build ships with \$1,000,000 capital, by John J. Conway, Robert G. Wilson Jr., and J. A. Hay.

The Powow Mfg. Co., Amesbury, Mass., recently was incorporated with \$50,000 capital, to manufacture castings and fittings for autos, ships and yachts, by Henly Miller, James H. Walker and E. K. Arnold.

The Sherbrooke Iron Works, Sherbrooke, Que., has been acquired by George L. Dourne and F. A. Schaff, New York, who will continue to operate the plant under the same name. Machinery will be installed in the plant for the manufacture of locomotive, marine

and stationary superheating apparatus, as well as other steam specialties. In addition to the new work, the company will continue to carry on a general foundry and machine shop business.

The Farragut Steamship Corp. recently was incorporated in Delaware with \$1,000,000 capital, by Sigmond Frelberg, Cincinnati; Louis Schwartz, Indianapolis, and Bertram M. Amesworth, Philadelphia.

The Seattle Shipbuilding & Dry Dock Corp. recently was chartered in Delaware with \$1,000,000 capital, by E. S. Hawley, George F. Jebbett and Charles B. McBride, New York.

The Pacific Welding & Mfg. Co., 935 South Grand avenue, Los Angeles, has been organized to manufacture welding equipment and similar specialties. Chauncey W. Tetwill, 1173 West Twenty-eighth street, is an officer of the company.

Capitalized at \$200,000 the Armstrong-Watson Co., Los Angeles, has been organized to manufacture pumps and pumping machinery, by Alexander Watson, Andrew Laidlow, Los Angeles, and Henry I. Armstrong, Long Beach, Cal.

Plans are under way for the erection of seven new buildings for general construction, repair and machine work, for the Norfolk Shipbuilding & Dry Dock Corp., Argyle avenue, Norfolk, Va. The work will be done at an estimated cost of \$100,000.

The Union Shipbuilding Co., Fairfield, Md., has awarded a contract for the erection of an addition to one of its plant buildings, to be 2-stories, 75 x 100 feet, and to be built at an estimated cost of \$30,000.

The Sun Shipbuilding Co., Chester, Pa., has perfected plans for a 600-foot drydock, with a number of other extensions and improvements. Three additional shipways will be built, a wetdock, 200 x

600 feet, and new shop buildings for general work. Plans call for the completion of the improvements by fall. The project, including machinery and equipment, is estimated to cost \$3,000,000. John G. Pew is president and F. S. Reitzel, secretary and treasurer.

The plant of the Quincy Engine Co., Chambersburg, Pa., will be placed in operation by the Southward Foundry & Machine Co., 430 Washington avenue, lessee.

The South Cove Engineering Co., Jersey City, N. J., has been incorporated with a capital stock of \$100,000, by G. L. Record, K. D. Tiffany and Thomas P. Connolly, to operate a shipbuilding and repair works.

The Southern Electrical Equipment Co., Charlotte, N. C., manufacturer of electrical devices and appliances, has been incorporated with \$100,000 capital, by Louis H. Hardin, president; D. E. Rohrer, secretary, and others.

The Carolina Shipbuilding Corp., Wilmington, N. C., will erect pipe and copper shops, and contemplates the erection of a concrete drydock with a capacity of 7500 deadweight tons. The improvements are estimated to cost \$1,000,000.

With \$2,100,000 capital, the Gdansk-Baltimore Steamship Corp., Baltimore, recently was chartered to engage in transoceanic service with Baltimore as one terminal. Incorporators of the company are: President, W. Bernard Duke, 200 Park avenue; William B. Mann, Albert W. Randall, and William W. Nottingham.

A recent New York incorporation is that of the Rohr-Schanck Oil Burner Corp., Brooklyn, N. Y., which was recently chartered with \$10,000 capital, by S. P. Cohen, W. P. Lowe and J. E. Worthington Jr., 120 Broadway, New York, to manufacture oil burners, etc.

## New Trade Publications

**CENTRIFUGAL PUMPS.**—An attractive booklet describing tests recently made on centrifugal pumps has been issued by the De Laval Steam Turbine Co., Trenton, N. J. Tests were made by the city of Minneapolis on a 20-inch De Laval centrifugal pump driven by an induction motor while similar tests were made by the city of St. Paul upon two 12-inch De Laval centrifugal pumps driven by synchronous motors. The booklet describes the tests fully and contains much interesting data.

**STEAM TOWING MACHINE.**—The Corbet Foundry & Machine Co., Owen Sound, Ont., recently issued a folder describing its steam towing machine. These units are made in five sizes to accommodate steel hawsers from ½ to 2 inches in diameter. The device is fully described. It is said to be well built and economical in operation. It is controlled by one lever which starts, stops and reverses the mechanism so that it can be handled by one man. An important feature of this machine is that it is equipped with an automatic leader, or guide, which travels to and fro across the front of the drum while the cable is being hauled in or paid out. This prevents the coils from climbing.

**OIL SEPARATORS.**—Oil separators of a new type are illustrated and described in a 11-page bulletin being issued by the Griscom-Russell Co., New York. The device works on the centrifugal principle and is said to remove all traces of oil from the exhaust steam. It operates by the centrifugal force set up in a current of steam, following along a spiral passage all water or oil in the steam being heavier than the steam itself is forced against the wall of the passage and held there as the forward movement of the mass sweeps it down into the receiver.

**PNEUMATIC HAND DRILLS.**—A leaflet describing pneumatic drills is being issued by the Turbine Air Tool Co., Cleveland. Two types of drills are described and illustrated. One has a capacity up to holes ½ inch in diameter in metal and weighs 11½ pounds while the other drills holes up to ¾ inch in metal and weighs 9 pounds. It is claimed that the drills

are well balanced, that they are easily operated and as near foolproof as it is possible to make them.

**DAVITS.**—The Hyde Windlass Co., Bath, Me., has issued a circular describing a new type of davit recently developed. The device is illustrated. It is pointed out that it lifts the boat from the chocks, carries it well over the side and to an outboard position with but little final lowering of the boat. It is said to have high fore and aft stability. The davit is operated by a single crank handle which causes a worm to actuate a worm gear.

**STEAM TABLES.**—The Wheeler Condenser & Engineering Co., Carteret, N. J., has just published the 1920 edition of its steam tables for condenser work. The booklet gives the properties of saturated steam from 29.8 inch vacuum to atmospheric pressure in increments of tenths of an inch. The vacuum in inches of mercury is referred to a 30-inch barometer. It is pointed out that this method gives absolute pressures in pounds per square inch. A complete table is also given of the properties of saturated steam above atmospheric pressure. The booklet also describes how to take measurements by means of the mercury column and barometer. It gives constants and tables for making corrections including corrections to be made for relative expansion of mercury and brass scale, etc.

**MARINE SIGNAL APPARATUS.**—A 12-page booklet describing fog bell controls, automatic whistles, whistle pulls and whistle controls is being issued by the McNab Co., Bridgeport, Conn. The booklet is illustrated and comprehensive descriptions are given of each article. It is pointed out that the automatic whistle control supplies the whistle with dry steam only thus producing a sharp, clear sound by eliminating hot water from the whistle steam pipe. It is said that this device is automatic in operation and that it requires but little attention. The automatic fog bell control is an interesting mechanism that is located inside the ship's bell. It is designed to work automatically by means of electrical connections and when set in operation gives the signals until it is stopped.